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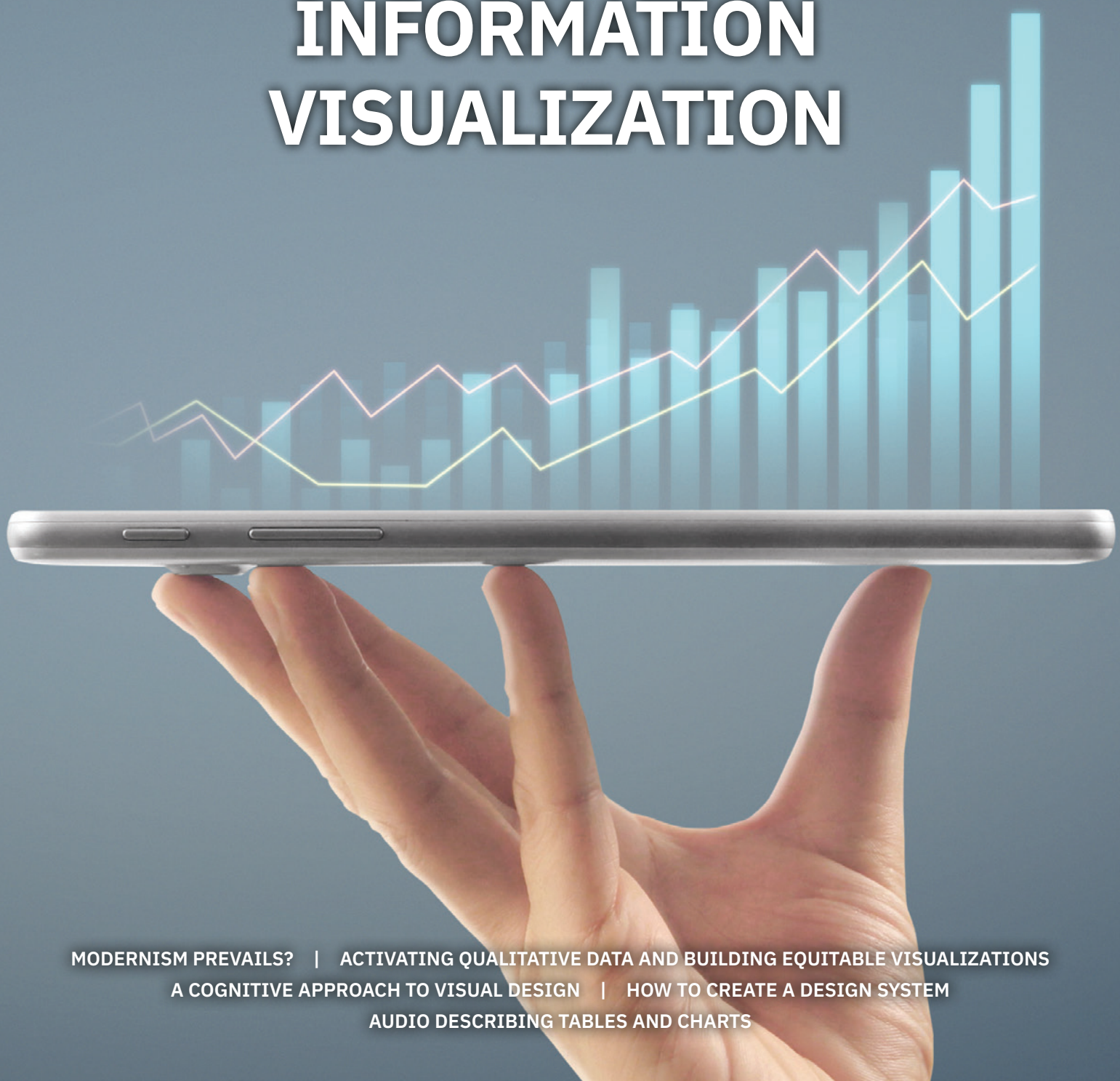
INFORMATION VISUALIZATION



MODERNISM PREVAILS? | ACTIVATING QUALITATIVE DATA AND BUILDING EQUITABLE VISUALIZATIONS
A COGNITIVE APPROACH TO VISUAL DESIGN | HOW TO CREATE A DESIGN SYSTEM
AUDIO DESCRIBING TABLES AND CHARTS

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A Note from the Editor

Our September/October 2023 features a Special Issue on Information Visualization with guest editors Amanda Horton and Dr. Jackie Damrau. This collection's theme focuses on the idea of rethinking visuals in your technical communication products. The topics in this issue which explore various angles of thinking about information visualization include creating a design system, modernist trends, alternative audio representations for accessible audiences, building equitable visualizations through qualitiative data, a cognitive approach to design, and a column focusing the marketing perspective of information visualization. As one of the core competencies of technical communication, visual communication is an essential skillset for students, practitioners, and academics in creating accessible, clear, interactive, and usable content. We hope you enjoy the features in this issue and that they will enhance your thinking and work about information visualization.

In this issue is also the first of a two-part feature Reflecting Backward on STC's 70 year history, which explores both past and future issues facing the profession and the Society. These issues are explored by three long-time STC Fellows Saul Carliner, Janice (Ginny) Redish, and Karen Schriver, who share their insights on the major developments, trends, concerns, and hopes for the profession. The second part will be featured in our November/December 2023 issue on Project Planning and Management in Technical Communication. A special thanks also goes out to the STC 70th Anniversary Task Force Chair, Nicky Bleiel for her work in coordinating the many events, features, and webinars throughout the year, reflecting back on our history.

If you would like to write for *Intercom*, we welcome topic ideas, short abstracts, as well as full-length features. Be sure to check out our updated Author Guideline's page on the STC Web site at https://www.stc.org/intercom/author-guidelines/ to learn all about formatting, preparing, and submitting your work. Upcoming issues will feature Project Planning and Management, Training and Development, Strategic Branding, and Accessible Design. But don't let this list limit your choice of topics—we gladly welcome submissions on any technical communication topic, as well. Email us at intercom-editor@stc.org with any questions about topic ideas. ■

Dr. Craig Baehr
Intercom Executive Editor
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Guest Editorial

Visual Communication Awareness

BY AMANDA HORTON and **DR. JACKIE DAMRAU** | Fellow

Visual communication is an area of awareness that all technical communicators should know about. It is an area that helps those that are not able to read the written word, can listen to the written word audibly, or to be able to determine signs in a visual manner without the need for understanding a particular language. Most common visual communication is in the graphical signage that we see on the streets (stop, yield, street lights) and airport signs (baggage claim, restrooms).

Within visual communication, we can go back into art history and graphic design to see how visuals started making a presence. Amanda Horton kicks off this guest-edited issue on Visual Communication with her article on "Modernism Prevails? Researching recent trends in information visualization." In her article she provides an insight into how graphic design is constantly shifting from being complex to being more minimalistic. The most prevalent forms of visual communication recently are seen in the "design of infographics or data visualization, identity systems for international corporations, and wayfinding systems." The form of data that we visualize also has a basis on being qualitative that involves "self-examination, attention to others, and intentionality through the design process," according to Christina Singer in her article on "Activating Qualitative Data and Building Equitable Visualizations." She shares three actionable strategies—Extract Yourself, Embrace Others, and Expand Data Collection and Visualization Mechanisms—to help you in knowing how to activate your visualizations.

Kirk St.Amant takes visual communication to a more cognitive level by sharing in his article, "A Cognitive Approach to Visual Design" how technical content is "becoming increasingly visual in nature" through instructional videos and infographics. He says that while design expectations vary for the type of visual media you are developing, there is a "common set of underlying psychological—or cognitive—processes involving mental models of how individuals…"picture" information when performing a task." Kirk shares the AICO method (actualization, identification, categorization, and operationalization) that will help technical communicators "create visual content that meets an audience's usability expectations."

Information visualization does take practice. Nikki Arnell's article, "How to Create a Design System for Successful Information Visualization," says that a "clear design must be formulated before consistently implementing it into any information visualization." Much like we have a technical writing style guide when writing text-based materials, we should also have a visual design style guide that guides on the proper ways in which to depict information graphically. Nikki provides "guidelines [that are] easily addressed to create a design system" such as having a consistent system of shape, space, and color; using a visual hierarchy in message delivery; and using color wisely (remember, not all readers see all colors the same).

The final article in this guest-edited issue on Visual Communication is on "Audio Describing Tables and Charts" by Brett Oppegaard, Qiang Xu, and Thomas Hurtut. Their article talks about the "design and production of everyday tables and charts" and how that can be conceptualized in an auditory manner for those who cannot read the written word. One takeaway from this article is to consider how a table or chart that appears in your documentation can be described in audible terms to a reader who cannot see it. This article focuses on making us aware of how we should think about making our tables and charts more accessible to "all" readers.

We want to give a special shout-out to all our authors. The articles could not have fallen into place more easily than we had originally thought. Thank you to my co-editor and author, Amanda Horton, and our issue contributors, Christina Singer, Kirk St.Amant, Nikki Arnell, Brett Oppegaard, Qiang Xu, and Thomas Hurtut. Enjoy this issue on visual communication and let us know if this inspired you to rethink visuals in your own communication. ■

Modernism Prevails? Researching recent trends in information visualization

The influence of modernism prevails in the design of information visualizations, despite criticisms that it may have the effect of suppressing culture.

By Amanda Horton

Trends in graphic design are constantly shifting, with new takes on historical approaches being rehashed all the time. Cycles can be traced from modernism to postmodernism and back again, and yet despite these cycles and shifting trends modernism appears to remain pervasive. Even those not familiar with the history of modernism are likely to recognize the name and its visual characteristics. Modernism was a shift in design that began in Europe in the early 1900s. It stripped design of ornament and worked towards an entirely new design practice with the goal of communicating to wide, even global audiences, through its economy of form, in short, it promoted minimalism. Then in the 1970s postmodernists rejected the ideologies of modernism, and instead made arguments for complex designs that even contradicted and pushed back against the ideas of modernism. While new trends in design are everywhere, characteristics of modernism can still largely be seen prevalently in the design of infographics or data visualization, identity systems for international corporations, and wayfinding systems.

The philosophies and approaches to modernist graphic design are often associated with the instructors at the Bauhaus, along with the work done by Jan Tschichold for the New Typography movement, both of which have had a powerful and lasting impact on the "rules" of design. The visual characteristics of modernism include the use of grids, sans serif type, economized or simplified graphics, which often prioritize geometric forms over organic ones, as well as a preference for whitespace and asymmetrical layouts. But today the philosophies, ideals, and methods of modernism have been criticized for their suppression of culture and diversity. Information visualization aims to make information accessible and clearly understood by broad audiences. Despite shifts in philosophies and practices, is modernism the answer for visually communicating with culturally diverse audiences? Will concerns about equitable practices in design lead to a shift away from modernist theories and practices, or will these practices continue in perpetuity? This article will consider modernist historical influences on trends in design, shifting perspectives and current criticism of those historical perspectives, and the role of aesthetics vs. ideology along with the current cultural climate to examine the perceived pervasiveness of modernist principles and their influence on various design practices.

Roots of Modernism

When it comes to modernism in graphic design, the historical precedents most often cited as having been the most influential for establishing modernist principles are the Bauhaus and the New Typography. The "Bauhaus's approach to design was truly modernist, scientific, and reductionist in its intention. It was modernist in its tendency toward abstraction, scientific in that it embraced Gestalt psychology, and reductionist in its attempt to get rid of the vestiges of Victorian design taste and to build a new sensitivity based on the basic language of form." (Kim, 2006) Individuals associated with this new exploration of form in graphic design at the Bauhaus would later emigrate to America where they would help influence the practice of modernist design.

> **Modernism is also easy to learn and execute; if you know "the rules" they can be applied in almost a formulaic or standardized approach. Perhaps this is the real reason that modernism continues to prevail, not ideology, because of its ease of use.**

The New Typography movement, spearheaded by designer Jan Tschichold, was also a leader in modern graphic design. Tschichold was inspired by and even worked with members of the Bauhaus, and their design aesthetics are very similar. The ideas that Tschichold proposed in his publication *The New Typography* outlined his principles for typographic design, many of which aligned with the Bauhaus. These principles also included a desire for clarity, suggesting that to best achieve this would be to remove all unnecessary and decorative ornament. Sans serif typefaces also became prevalent in the work that was put out by modernist designers, because serifs were viewed as ornamental. Whitespace became a key element of modern design.

One of the primary goals identified by these modernists was to create a universal approach to design. The premise of universal design was that decoration was culture-specific and that by removing all ornament and decoration the designer could cross language and cultural boundaries and the resulting design would be better understood by audiences. It is easy to see why modernism was and is the preferred practice for visual communication for any design that intends to communicate to culturally diverse audiences. Modernism and its principles were described as a "Universal" design practice for communicating visually to global audiences.

Two historical examples of modernist design principles in action were the information graphics created by Otto Neurath and his team for the ISOTYPE, or International Typographic Picture Education (see figure 1), and the graphics designed by Otl Aicher for the 1974 Munich Olympic games, including the logo and pictograms (see figure 2). The abstraction and reductionist philosophies of modernism led to the use of economized forms and a preference for geometric shapes such as circles, squares, and triangles, which became characteristic of their work. Additionally, the number of weights and sizes of typefaces were reduced in designs to maintain clarity. These ideas coupled with the insistence on simplicity and clarity through the removal of all ornamental details led visual communicators such as Neurath and Aicher to develop systems for information design that were simplified to the smallest details, which these designers argued allowed the message to be clearly and prominently displayed for diverse audiences, which was the goal of both the infographics designed by ISOTYPE and the Olympic Graphics.

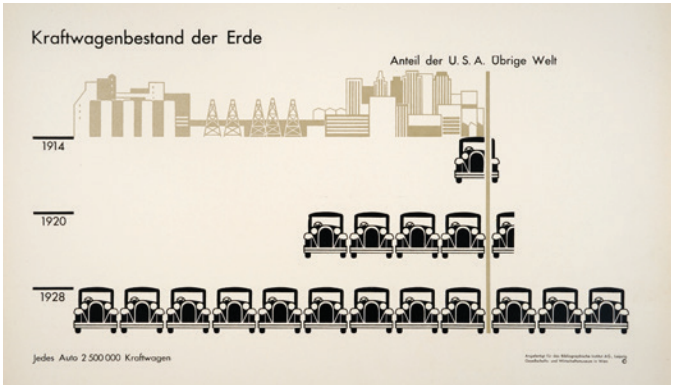

Figure 1. Otto and Marie Neurath Isotype Collection, University of Reading.

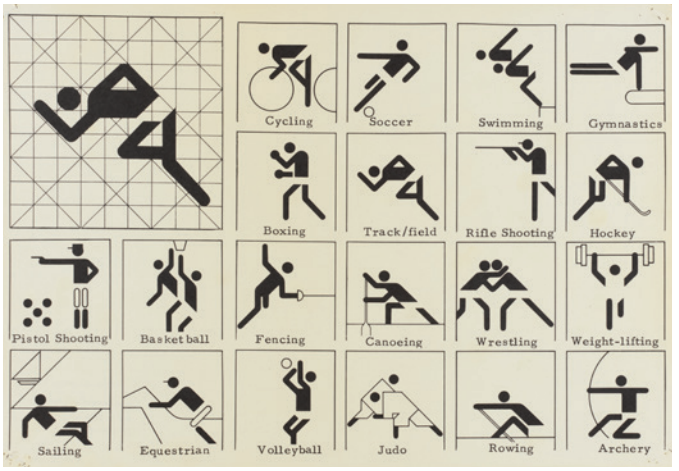

Figure 2. © Cooper Hewitt, Smithsonian Design Museum / Art Resource, NY

Or is it...

In 1910 architect Adolf Loos gave a lecture and subsequently published a paper on "Ornament and Crime", this paper and its condemnation of ornament, is often cited as one of the founding ideologies of modernism, in which ornament is equated with primitivism and criminals. Loos points to tattoos as ornaments found on what he saw as "primitive" peoples as well as on prisoners and criminals as part of his proof of his claims. This paper, which became foundational to the creation of the modernist movement, clearly stated racist and imperialist ideals that linked ornament to culture and called for a complete rejection of all ornament in architecture and design. Today many theorists and historians cite this suppression of culture as fundamental to modernism. Around this same point in history, there was a rise in interest in Eugenics which led to some forced sterilization programs for disabled people, people of color, and those of low economic status. According to Daylanne English, author of *Unnatural Selections: Eugenics in American Modernism and the Harlem Renaissance* "Eugenics, the science of breeding better human beings, saturated U.S. culture during the 1920s. It seeped into politics. It permeated social science and medicine. It shaped public policy and aesthetic theory... It affected popular culture. Eugenic thinking was so pervasive in the modern era that it attained the status of common sense" (2004) while English is making an argument for the connection of Eugenics to modern literature, here the connection to popular culture, aesthetics, and design could be linked

through writings such as that of Adolf Loos. In an opinion piece for the UX Collective author, Ronke Babjide states that "Adolf Loos was a child of his time. Fascism, race theory, and supremacy weren't limited to Nazi Germany. There was a prevalent mindset in certain circles around Europe that supported the idea. The belief was that European cultures are superior to others. To be civilized meant you had to be exactly like them. The civilized "New Man" had simple, minimalist tastes." (2022) In her book *Decolonizing Design* (2023), Dori Tunstall, the first Black dean of faculty of design, reminds us that "The Bauhaus's "universal man" for whom they were designing was the working white man" and that "Design practices that draw their origin stories from the modernist project thus perpetuate the biases of the supremacy of white bodies and cultural values." (p. 58)

The Dominance of Modernism

Today, many designers and design educators who actively embrace diversity and cultural differences are pushing back against the dominance of modernism in design history, theory, and practice. There are calls to "throw the Bauhaus under the bus" (Silas Munro and Ramon Tejada) and focus on education and design history "Beyond the Bauhaus" (AIGA Design Educators Community). And yet many of the "Rules" of visual design today are often still very much in line with modernist principles. Trends come and go and yet modernism refuses to die, we still see an astounding amount of modern design. Why is modernism so pervasive? This is a hard question to answer but interrogating where we see modernist design most frequently is perhaps a place to start. Global international companies seem to still lean heavily on modern design of their logos and identity systems, as well as infographics and wayfinding systems, and the thing that all of these have in common is the need to communicate across language and cultural barriers. Were the modernists right after all? Or is modernism just "safe" and big corporations are simply afraid to take risks? Design is thought to be progressive, but what if it is not as progressive as we think? The graphic design profession is still largely white, with white men (mostly) in leadership roles. How does this translate to how design is practiced? Or is this simply a case of aesthetics over theory/ideology?

In many of the world's most recognized logos, one can observe that the characteristics of modern design are still in play, scanning articles such as "World's Most Famous Logos and The Stories Behind Them" as well as "37 Of The World's Most Famous Logos and What You Can Learn From Them", reveals a litany of logos from international corporations that could mostly be described as modern. In an article from AIGA Eye on Design, Jarrett Fuller points out that "In the last few years, it seems every big company, from Warner Brothers to PetCo to Mastercard to Sam's Club has jumped on the bandwagon, stripping their brand down to basic parts, cohering around a homogenized, minimal aesthetic that can sell anything from dog food to data, credit cards to car rides." (2021) Additionally, publications such as *Information Graphics* edited by Sandra Rendgen, and published by Taschen published in 2012 reveal an overwhelming influence of modernism on information graphics that is still practiced today.

In his article, "Graphic Designers Have Always Loved Minimalism. But At What Cost?" Jarrett Fuller reminds us that design is a pendulum. Jan Tschichold, the founder of the New Typography movement, later rejected the constraints of his own movement, he came to see these rules as too restrictive and dogmatic, which was something he associated with the Nazis who had harassed him for his progressive ideas and forced him out of Germany. This was a connection he wished to avoid. However, Massimo Vignelli, one of the champions for modernist design well into the 21st century argued that modernism was an ethical practice and that "Modernism was a commitment against greed, commercialization, exploitation, vulgarization, cheapness. Modernism was and still is the search for truth, the search for integrity, the search for cultural stimulation and enrichment of the mind. Modernism was never a style, but an attitude." (1991, p. 51). It is probably safe to say that he would have denied any allegations that ideals of modernism were in any way connected to those of Eugenics or were responsible for diminishing the value of culture in design, he even called postmodernism a fad. And yet most likely we will see the pendulum swing back towards postmodernism, only to return at some point back to modernism once again.

The Future Trend Cycle

But in attempting to understand trends in design we must also acknowledge the role that algorithms will play in future trends. Algorithms used on social media function to feed viewers content that is similar to the content they have seen, and liked, before. In terms of design, this has the potential to create an oeuvre that is homogenous, leading users to see and believe that certain trends are bigger than they really are, or to feed into trends making them bigger than they would otherwise be. Perhaps this is the real reason modern/minimalism is so prevalent today, the already prevalent use of these algorithms.

How many people know the history of modernism and its connections to racist and cultural imperialism? In truth probably not many. Today most people do not associate the term Universal Design with modernism, in fact, Universal Design has become the popular terminology for the practice of design for accessible audiences and for providing equitable design solutions, not stripping design of culture. The continued use of modernist design practices could be more about aesthetics than ideology. I for one am drawn to the aesthetics of modernism, though not at the expense of homogeneity. Modernism is also easy to learn and easy to execute; if you know "the rules" they can be applied in almost a formulaic or standardized approach. Perhaps this is the real reason that modernism continues to prevail, not ideology, but because of its ease of use.

Conclusion

Ultimately each designer has to make design decisions thoughtfully and carefully, as we have seen even Jan Tschichold, founder of the New Typography movement, later rejected the ideals of the movement when he began to see them as too rigid. With current criticisms of modernism, it is important to consider why we continue to use this approach to information visualization. Is it because it truly is what the modernists thought it was, a movement that could strip design of culture and therefore effectively communicate beyond cultural boundaries? Or is it homogenizing? By using modernist principles of design, are we truly communicating beyond culture, or are we suppressing it? One thing to keep in mind when making decisions about design is that diversity and culture are usually what audiences find most intriguing. It can be difficult to thoughtfully incorporate cultural elements into design, but that doesn't mean it isn't worthwhile to pursue. ■

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Activating Qualitative Data and Building Equitable Visualizations

Equitable methods for data collection and information visualization.

By Christina Singer

Designing equitable information and visualizations involves self-examination, attention to others, and intentionality throughout the design process. You are possibly a user of your product, but you are certainly not every user. No amount of empathizing with others will change anyone's circumstance—learning from and designing with others can, though. Humans in decision-making positions must be reflexive and expand data collection and visualization mechanisms to improve the quality of datasets and achieve better experiences. This article shares three actionable strategies that can be used to activate qualitative data and build equitable visualizations and solutions [see Figure 1].

Extract Yourself

Positionality

Positionality is a combination of factors in your life that shape your way of seeing the world and inform your unique position. Your positionality affects how you communicate, make decisions, and navigate life. To start, I will visually communicate my positionality [see Figure 2].

By mapping and reflecting on your positionality, you are able to better identify and articulate your own biases, privileges, and potential blind spots when trying to empathize with others. You have experienced life one way, which has given you your own way of seeing the world and approaching circumstances. Therefore, you can't truly relate or empathize with the exact experience someone else has had.

Mapping or clustering your stakeholders' positionalities can help you better understand their circumstances and where they have come from in life when they approach your product or service. It is important for teams to understand who the users are and what they need or know by gathering qualitative data before or with quantitative data, and then reflecting on the results of both data sets. The list below [see Figure 3] is composed of various factors to consider when forming user interviews or surveys to determine the intricate positionalities of your users, and in turn inform your visual and written communications to them.

The list below is a starting point, as individuals will likely come up with other factors to explain their unique positionalities related to your product or project. Note that many of the factors—which impact our lives from childhood and inform how we may inherently see and interact with the world—are out of our control. These factors inform how we make decisions, what knowledge we have access to, and how we respond to language and symbols used in written and visual communications.

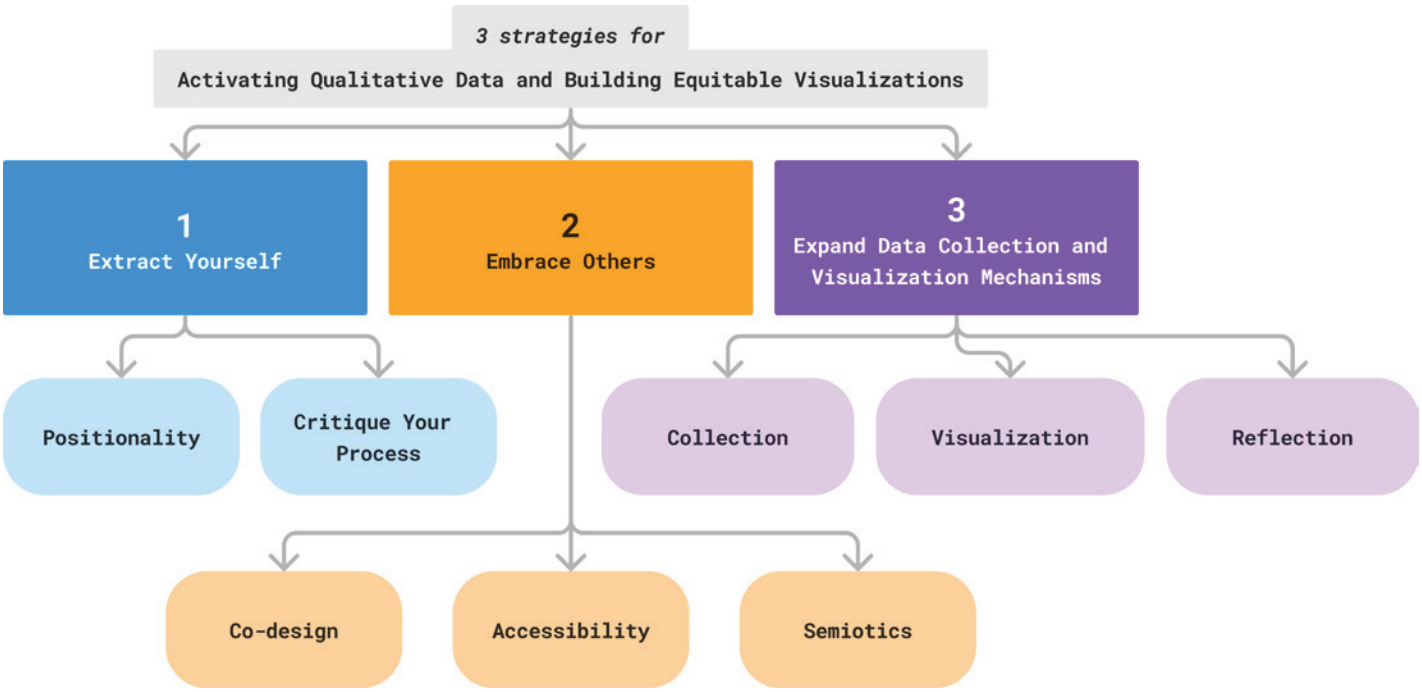

Figure 1. Three strategies for activating qualitative data and building equitable visualizations

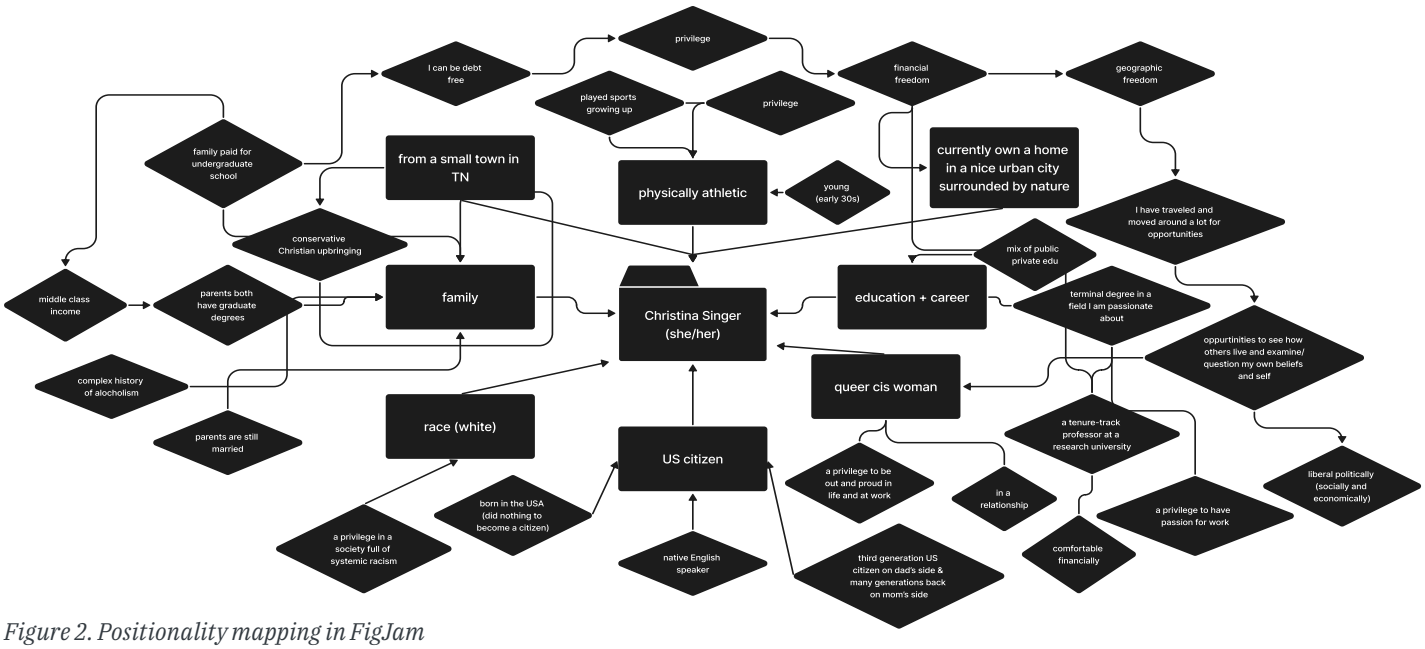
privilege
I can be debt free
financial freedom
geographic freedom
played sports growing up
privilege
family paid for undergraduate school
from a small town in TN
physically athletic
young (early 30s)
currently own a home in a nice urban city surrounded by nature
conservative Christian upbringing
I have traveled and moved around a lot for opportunities
mix of public private edu
middle class income
parents both have graduate degrees
family
Christina Singer (she/her)
education + career
terminal degree in a field I am passionate about
complex history of alocholism
queer cis woman
oppurtinities to see how others live and examine/ question my own beliefs and self
race (white)
parents are still married
US citizen
a tenure-track professor at a research university
a privilege to be out and proud in life and at work
in a relationship
liberal politically (socially and economically)
born in the USA (did nothing to become a citizen)
a privilege to have passion for work
a privilege in a society full of systemic racism
native English speaker
comfortable financially
third generation US citizen on dad's side & many generations back on mom's side

Figure 2. Positionality mapping in FigJam

YOUR CHILDHOOD EXPERIENCE & FAMILY HISTORY:

- **Socioeconomic status growing up**
- **Adverse childhood experiences**
- **Geographic region(s) of childhood development, and possible factors that impact your initial perspective in life, ie:**
  - + Vernacular language
  - + First and second languages
  - + Access to clean water
  - + Access to heating and air conditioning
  - + Accents
  - + Cuisine/food culture and norms
  - + Local symbols
  - + Local cultures and subcultures
- **Family dynamics and influences, ie:**
  - + Parents divorce, or single parent family
  - + Hetero-normative parents or LGBTQ+ family
  - + Adopted
  - + Only child or has siblings
  - + Parents owned a home, rented, lived with other family members, experienced homelessness, etc.
  - + Raised by other legal guardians or in the system
  - + Religious affiliations
  - + Political influence
  - + Family history, ancestors, heritage, and cultural traditions
  - + Access to health care
  - + Exposure to Addiction
  - + Experienced abuse (verbal, emotional, physical, sexual)
  - + Generational trauma
  - + Witness or experience speech or violence related to racism, homophobia, xenophobia, or other forms of hatred
- **Opportunities, ie:**
  - + Tutoring
  - + Summer camp
  - + Travel
  - + Sports clubs
  - + Access to art, music, or dance lessons
- **Citizenship status**
  - + Status of you and your family members
- **Educational background of your parents/guardians**
- **Occupations of your parents/guardians**
- **Educational background growing up, ie:**
  - + Public and/or private schooling
  - + High school graduate

FACTORS THAT IMPACT YOUR CURRENT WAY OF SEEING THE WORLD:

- **Race**
- **Age**
- **Marital status**
- **Monogamous or polyamorous**
- **Relationship status**
- **Family status or relationship with family**
- **Have children, does not have children**
- **Sexual orientation (inclusive list of sexual orientations)**
- **Gender (inclusive list of genders)**
- **Ethnicity**
- **Geographic location**
- **Political affiliation**
- **Religious affiliation**
- **Citizenship status**
- **Language**
- **Socioeconomic status**
- **Able-bodied or experiencing health conditions or impairments**
- **Mental health status**
- **Education level (Higher education institutions and degrees)**
- **Occupation(s)**
- **Organizational memberships (professional, recreational, or other)**
- **Access to health care**
- **Access to art and culture centers**
- **Own a home, rent, or experiencing homelessness**
- **Access to transportation**
- **Food security or insecurity**
- **Access to art, technology, and Internet**
- **Financial literacy**
- **Credit score**
- **Ambitions and goals**

Figure 3. Positionality factors to consider

Lesley-Ann Noel and Marcelo Paiva (2020, February) published a publicly-available online article "Learning to Recognize Exclusion," from the *Journal of Usability Studies*, which includes a unique way to visualize and cluster positionality maps from a group of people into a "positionality radar chart" using a worksheet they designed to help teams determine equity gaps. The worksheet focuses on eleven categories, and is available to download from the references section of their paper, or by searching "positionality radar" in the Figma Community. This resource is a useful tool that can be used to visualize and identify equity gaps in a group of people, such as your team or your users. When you have gathered and visualized the data from your users or team, that is just the starting point for reflection and action.

When learning about others' positionality, it is important to avoid a deficit mindset. In the book *From Equity Talk to Equity Walk*, Tia Brown McNair, et al. (2019) explore how deficit-mindedness can lead to cold, demeaning language being used to communicate in documents. Look at your positionality map and look at someone else's. What are you assuming about them? If you naturally view a difference in a lived experience between you and them as negative, then you are assuming a deficit mindset. Learning more about your positionality and consciously unlearning that differences with others are negative are two good steps towards creating more equitable data collection and human-centered solutions.

Critique Your Process

What methods does your team use throughout your creative and research process, and how can those methods be biased or become more equitable? For example, personas are a common method used in design processes, and are typically informed by primary and secondary research. Your team may synthesize and simplify information about a group of users, and use that data to generate a persona that represents the goals, values, and frustrations of a larger group of users throughout the design process.

With the knowledge that everyone's positionality is so dramatically different, how can you be conscious of this when creating and using personas? Another great equity resource from Noel (2020, October) is "The Designer's Critical Alphabet." The website, criticalalphabet.com, poses terms such as Westernization and xenophobia, and the user is encouraged to question if their design has considered these critical terms and reveal any blind spots or biases. I use this list of terms with my students in a senior-level design research course to critique methods used by IDEO, IBM, and other companies. We discuss how we could use or adapt certain methods to be more mindful and equitable. How might your team apply these terms to critique your process?

Embrace Others

Co-design

A particular usability testing method from IDEO that stands out as potentially problematic is the "empathy tools" method (William Stout Architectural Books, 2003). This method attempts to simulate an impairment of the user when testing a product to determine the usability of the product and the user's needs. The designers would simulate a partially blind user with foggy goggles or a user with limited mobility in their hands with clunky gloves. This simulation is problematic for a number of reasons, but the primary reason is that no simulation is ever comparable to the real experience. In designing a product for a group of users, the design process should involve the users as co-designers without making assumptions or trying to simulate the user's experience. This is called co-designing. Many methods from IDEO and other organizations with similar design thinking frameworks do embrace co-design in a range of methods. It is important for teams to address bias throughout their process in order to reveal their limitations and disclose their inability to truly empathize with certain users.

Per Mollerup (2015) summarizes Steven Kosslyn's eight psychological principles for creating successful data visualizations, and the "principle of appropriate knowledge" stands out when co-designing, such that the creator of information or visual designs should use appropriate language for users and not patronize them or use unrelatable industry jargon. Kaleena Sales (2022) notes in her essay in the book *The Black Experience in Design* that when we prioritize communicating to the audience, we should consider the

cultural backgrounds of the primary users and include pertinent visual language while steering away from the International Typographic Style as a default. What would it look like to make the visual language of your product more culturally aware and accessible to the primary users of your product?

Accessibility

Accessibility is not only done in good faith to create designs that work better for everyone, but it is also a legal obligation for companies to provide equitable digital and physical experiences. The government has set standards in terms of what qualifies as accessible for the web, but those standards don't necessarily come with directions for how to achieve equitable products. AccessiBe and other online services that work to make your products more accessible can be great, but pricey. IBM Accessibility is a free, equal access toolkit that provides directions for creating accessible user experiences.

> **It is important for teams to understand who the users are and what they need or know by gathering qualitative data before or with quantitative data, and then reflecting on the results of both data sets.**

While some simulations of experiencing impairments fall short, such as empathy tools, others can be more accurate for creating products to then test with users experiencing certain impairments. One particularly successful free accessibility checker, Color Oracle, simulates colorblindness by changing how you see color on your computer screen. It is compatible with Windows, Mac, and Linux. Another tool that checks for legally-necessary color contrast in interfaces, typographic hierarchy, and allows you to create flows that direct e-readers throughout the page is Stark, a software plugin for Figma, Sketch, Adobe XD, and other programs. Stark has a limited free base plan, but to access more features you will need to pay.

Semiotics

It is critical for the designer and developer team to avoid stereotyping any culture or subculture with color palettes, iconography, terms, and other imagery and graphic elements when storytelling with data or information. One of the best ways to know if elements of your design would be offensive to members from a diverse audience is to have designers from a range of subcultural backgrounds represented on the team. If that is not currently the case for your team, and a large portion of your users or viewers are unlike yourself, then it is your duty to thoroughly research the meaning of imagery you are using and test the product with a diverse group of users. Your error could be as seemingly simple as using a culturally insensitive typeface. Ellen Lupton (2021) writes about how people often stereotype cultures as "tribal" when they misappropriate typefaces to represent a culture other than that which the typeface was originally designed to symbolize.

As Ruben Pater (2018) writes about cultural differences in *The Politics of Design*, visual literacy has to be learned, and it develops in different ways across cultures. Transcreation is the process of translating stories and visuals from one language and culture to another while maintaining the integrity of the original concept. Illustrators, copywriters, artists, and designers who are launching products across cultures should practice transcreation by commissioning illustrators and translators from diverse cultures to adapt the visuals and language for their cultures. For instance, when the *Powerpuff Girls* entered Japanese markets, the anime underwent visual and linguistic transcreation through a collaborative process between Cartoon Network and Aniplex to better suit the Japanese audience. Similarly, sometimes culturally-aware subtle shifts occur in films, such as *Inside Out* and *Big Hero 6*. In *Inside Out*, the vegetables on the child's plate change from broccoli to peppers based on the viewer's location. As for *Big Hero 6*, the Japanese names of the main characters change for Korean audiences due to deeply-rooted historical tensions between the countries.

The use of terms and imagery that seem inoffensive to you might trigger generational trauma for someone else. Adobe InDesign recently renamed master pages to be called parent pages—a direct response to the connotation that the term "master" has in the historical context of slavery. Many industries are rethinking terms and even brands by revisiting their use of offensive language and visual imagery and making changes to terms and imagery in response to negative associations with those words or symbols. How might your team analyze your work and consider being more mindful of how various users could interpret your language or visuals based on historical connotations?

Expand Data Collection and Visualization Mechanisms

Collection

While data collection can never be purely objective, it can do better. User testing groups for products with broad audiences should be intentionally diverse, minding qualitative data derived from the unique positionalities of individuals [see Figure 3]. Through the Algorithmic Justice League (AJL.org), computer scientist Joy Buolamwini—aka Dr. Justice—talks about poorly engineered products that lead to discriminatory user experiences due to inequitable data collection processes. Machines and artificial intelligence that detect voices and faces, as Buolamwini notes, are created by humans, and datasets that inform them inherit the biases of their makers. Inadequate diversity in user testing groups is part of the problem.

As Catherine D'Ignazio and Lauren F. Klein (2020) point out in their book *Data Feminism*, it matters what we count, such that even quantitative datasets are often incomplete or misinformed due to the exclusion of nonbinary data collection. Most large institutions, such as universities, are still only collecting data on users based on gender binaries, which leads to inaccurate representations of human experiences and solutions that don't account for those excluded from the system that was designed based on inequitable data collection.

Visualization

Giorgia Lupi (2023, February) coined the term *data humanism* to describe a more personalized and human data collection and visualization process that embraces visualizing qualitative data such as human stories. Data represents humans, but often lacks any human quality beyond numerical interpretations of reality. Qualitative data can make quantitative information more usable and informed, leading to more human-centered solutions. Collecting and visualizing both qualitative and quantitative data is often necessary in order to most accurately understand the nuanced details of the humans and systems being evaluated. What if your exercise app asked and collected *why* you exercised more or less that day, and offered you health tips to address your reality rather than simply quantifying and visualizing your highs and lows? Lupi asks us to consider the following question when reflecting on the data that we have collected: "What can we learn from this on a more human level—and what does it mean to the world?"

Reflection

Data that is collected should be accurately represented in a visualization, but our responses and problems we identify when synthesizing the results to propose solutions or changes must take into account the human narrative underneath the numbers. Mindful reflection on the data collected is required before it is visualized, and then again after it is visualized (McNair et al., 2019). *Where* do you observe differences in the data for various users, *how* might those differences be caused by inequities, and *why*? What additional qualitative and quantitative data might you need to collect in response to your new questions from reflecting on your visualization? Equitable solutions aren't natural in a world that has been designed to benefit some more than others, so as an actor in this system, how can you do better? ■

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A Cognitive Approach to Visual Design

A practical method technical communicators can use to understand and address the mental models an audience relies on when using visual content.

By Kirk St.Amant | Fellow

Technical content is becoming increasingly visual in nature. Instructional videos often supplement written instructions and infographics increasingly explain technical concepts to users. While design expectations can vary, they reflect a common set of underlying psychological – or cognitive – processes involving mental models of how individuals think about, or "picture," information when performing a task. The ARCO method (Actualization, Recognition, Categorization, Operationalization) can help technical communicators understand these cognitive processes.

The ARCO method identifies the mental models shaping an audience's uses of visual content. It does so by focusing on four core cognitive activities involved in visual processing: actualization, identification, categorization, and operationalization (ARCO). As such, technical communicators can use the ARCO method to create visual content that meets an audience's usability expectations.

Mental Models and Visual Content

Creating effective visual content involves understanding how the mind uses mental models to process visual information. Essentially, these models are mental pictures of what individuals think something should "look like." If individuals hear or read the word "car," for example, a mental picture of a car – that person's mental model for "car" – generally springs to mind. These mental models greatly influence how individuals use visual information.

When individuals encounter visual content, they compare it to the mental models they have for different items. The more that visual content resembles a particular mental model, the more likely individuals will identify that content as the thing represented by the related mental model. So, the more an image resembles a person's mental model for a car, the more likely that person will identify that image as "car."

Mental models are not universal. Rather, individuals create them based on their experiences. As a result, different audiences can have different mental models for the same item. This factor can affect how easily members of one group can use visual content created by another. This means, content creators cannot assume their audience will have similar expectations for visual content. Rather, content creators need to identify the mental models shaping an audience's perceptions of visual information. The ARCO method helps achieve this objective.

Understanding ARCO Dynamics

The ARCO method examines how audiences use mental models when interacting with visual information. Essentially, the human mind does not randomly engage with visual content. Rather, it generally processes visual information via a four-step process comprised of

- Actualization: How individuals focus their attention on visual content
- Recognition: How individuals recognize, or identify, visual content
- Categorization: How audiences determine the function(s) of visual content
- Operationalization: How audiences determine the intended use of visual content

Summed up by the acronym "ARCO," each step involves identifying the mental model that guides the related action.

If visual content addresses audience expectations, the mind will perform these four steps almost instantly. If visual content fails to meet audience expectations during any step in this process, confusion can result. The ARCO method provides a framework for identifying an audience's expectations for each step of this process.

Applying the ARCO Method

The ARCO method identifies the mental models affecting each step in the process individuals perform when they encounter visual content. After identifying such expectations, technical communicators can design visual content audiences can more easily use per this process.

A - Actualization

Actualization, the first step in using visual content, involves finding that content. The mind does so by using one of two processes.

- Process 1: Individuals might not have a mental model for an item, or they might not know what they are trying to locate (don't know which mental model to use to find visual information). If this is the case, visual elements that contrast markedly from their surroundings will better catch and hold attention. For user docs, this could mean creating a manual that has a completely different colored cover from all others that might be on a shelf. For an interface, this could be a button colored to contrast greatly from all other visual elements on an interface.
- Process 2: If individuals know what they are trying to find, a different process occurs. These persons access the mental model of what they are seeking and scan their surroundings until they locate something matching that model. Essentially, if an audience has prior experience with certain design elements, technical communicators must create visual content that parallels these designs to attract that audience's attention.

If visual content does not address these dynamics, audiences will give up on searching for an item or focus on the first thing that catches their attention.

To determine which process an audience uses to guide actualization, technical communicators should ask members of the intended audience

- *Have you performed a process before or is this your first time doing so?*

The answer to this question helps determine how individuals search for content and which strategy to use (high contrast or model matching) to create visual content the audience can easily find.

R – Recognition

After focusing attention on something, individuals need to identify what that item is. This step is recognition, and it involves how audiences match visual content to existing mental models.

Essentially, individuals compare visual content they encounter to entries in a database of mental models representing things they recognize. The more the design of visual content matches one of these mental models, the more likely individuals will "recognize" content as that item. So, the more a picture of a hammer resembles someone's mental model for a hammer, the more likely that person will identify the picture as "hammer."

This matching process involves the features – or characteristics – of an item. When individuals compare a visual of a hammer to their mental model for a hammer, they don't compare one overall item to the other. Rather, they compare the characteristics of the visual content (shape, color, etc.) to those of a mental model. The more characteristics in common, the closer the match, and the more likely the identification. The fewer the characteristics in common, the less likely identification.

Accordingly, the process audiences use to locate (actualize) visual content affects how they identify that content. This situation means the step of recognition involves one of two methods:

- Method 1: If individuals use an existing mental model to locate something, then the content creator can assume the audience will use that same mental model to identify it. In this case, designing for actualization includes designing for recognition.
    - *Example*: Using an image of a hammer that has the same characteristics the audience uses to locate/identify a hammer as the image used to identify the hammer.

or

- Method 2: If individuals don't know what they are searching for, actualization and recognition could involve different factors. In this case, visual content must be high contrast to attract attention, but it should also replicate the design of an existing mental model to be recognized.
    - *Example:* Using an image of a bright red hammer to attract attention (the color) and be recognized (matching a mental model).

Both methods require technical communicators to identify the mental models – and associated characteristics – audiences will use to recognize visual content. In either case, the technical communicator needs to design visual content to have as many

characteristics as possible in common with an audience's mental model for that item.

To identify the mental models (and characteristics) an audience uses to recognize visual content, technical communicators need to ask members of that audience

- *Can you describe [item X] for me? What features/ characteristics should it have?*

The resulting answers help determine the features an item should have so audiences can readily recognize the visual content they have found.

Creating effective visual content involves understanding how the mind uses mental models to process visual information. . . . The ARCO method helps achieve this objective.

C – Categorization

Just because individuals recognize what visual content is does not mean they know what it does or how to use it. In fact, an audience might associate different uses with the same visual content. These situations involve the step of categorization – or determining the function of recognized visual content.

As with recognition, categorization is based upon using mental models created through prior exposure. If an audience has previously used a telephone receiver icon to access a "make phone call" feature, they will likely associate similar visuals with that function (categorize them as a "phone call app"). If, however, prior experiences involved using this icon to access a contacts list, the audience will associate that design with this "access contacts" function.

To address categorization, technical communicators must determine:

- What functions or uses an audience associates with certain visual content
- If such associations include using that content as expected or needed

To identify the mental models affecting categorization, technical communicators should ask members of the intended audience

- *Can you tell me what [item X] does? How do you use [item X] to perform that process?*

The responses help identify what function an audience associates with certain visual content.

If audiences are unfamiliar with the intended use of visual content, technical communicators should consider one of two options:

- Option 1: Use visual content the audience will recognize and use as intended (replace current visual content with that the audience will use as intended).

or

- Option 2: Modify visual content to include explanatory text (e.g., designing an icon to include the words "tap to make a call").

At this level, changes to visual designs could affect earlier actualization and recognition processes. For this reason, technical communicators need to review any modified visual content to make sure the intended audience can still locate, recognize, and use it.

O – Operationalization

Audiences often associate visual designs with multiple functions (e.g., a red button can be used to turn something on or turn it off – or both). Making sure audiences select the correct use of visual content involves understanding operationalization, the final step in the ARCO process.

Operationalization is a matter of context as the mental models for using items often associate a particular use with a certain setting. So, after the mind locates, identifies, and categorizes an item, it reviews the context in which the item appears and determines how the item should be used in that context. This final step is guided by the mental models that reflect where individuals have previously used certain items.

Addressing operationalization involves two (2) steps:

- Step 1: Determine the context an audience associates with a particular use (the intended use) of visual content.

  For this step, technical communicators should ask members of the intended audience

  - In what settings or locations do you use [item X] to do/perform [specific, intended task]?

  The responses help identify the context audience members associate with using visual content in certain ways.

- Step 2: Present content within that context to ensure that intended use.

  For this step, technical communicators could modify the design of visual content to provide the context audience members need to recognize the intended use of that content. For example, to indicate something is an app for making phone calls, the technical communicator might present the item within the screen of a smartphone. Alternatively, to indicate the item is used to access a contacts list, the technical communicator might present it as juxtaposed with an image of an address book.

In both situations, the strategy involves designing visual content (call phone icon) to appear within the context audiences associate with a particular use (screen of smartphone). Doing so helps ensure audiences use that content as intended.

While simple, the approach described here can help identify a wealth of information on audience expectations for visual content. Technical communicators can also modify this process to collect additional information as needed ("Can you draw an example of [Item X] as you describe it?"). The resulting answers provide insights technical communicators can use to create visual content an audience can easily locate, identify, and use.

Final Thoughts

What constitutes usable visual content can vary from audience to audience, and such differences can create challenges for technical communicators. The ARCO method helps address this situation by identifying the mental models affecting how audiences locate, identify, and use visual information. By using this method, technical communicators can take steps to create usable visual content for different audiences. ■

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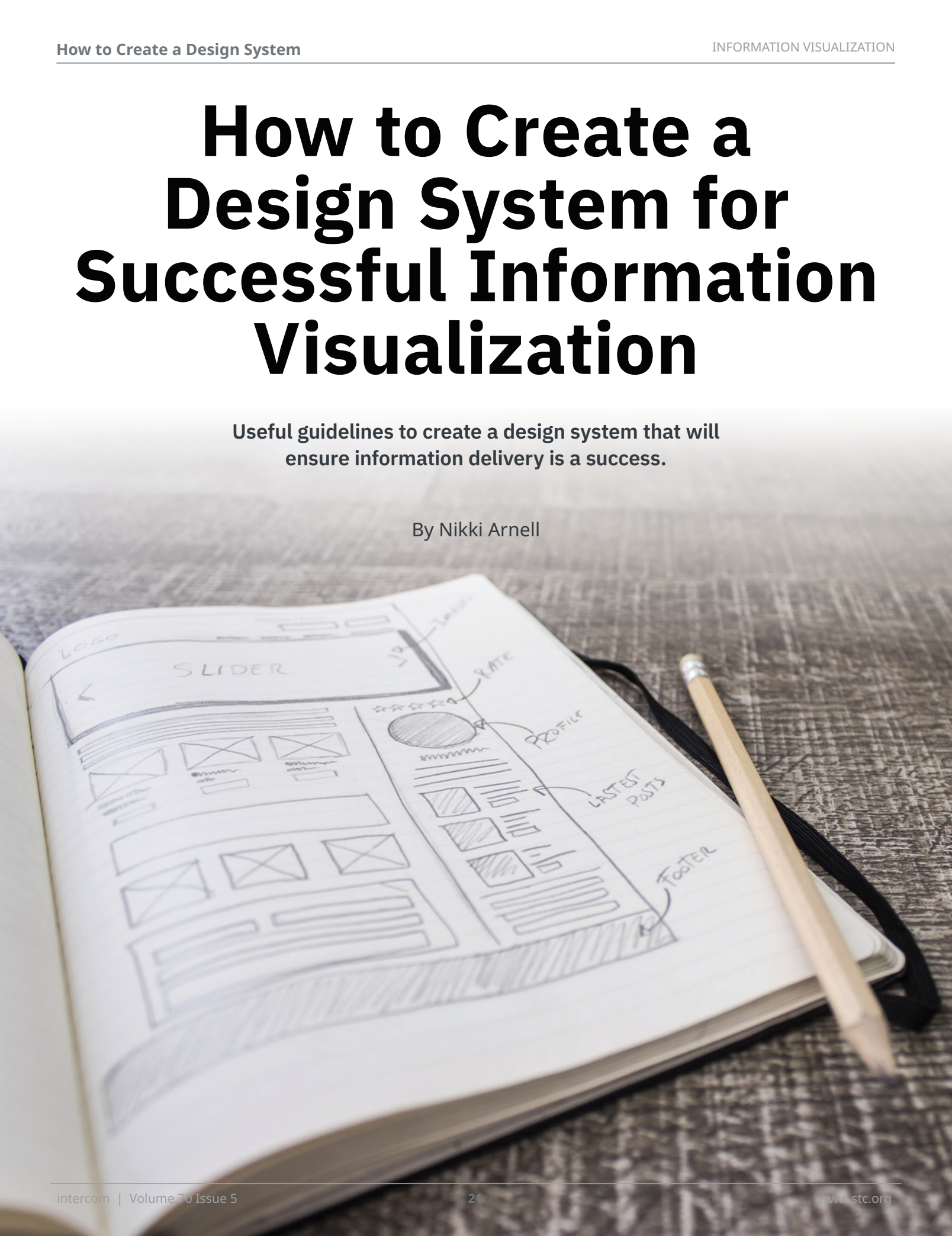
How to Create a Design System for Successful Information Visualization

Useful guidelines to create a design system that will ensure information delivery is a success.

By Nikki Arnell



A clear design system must be formulated before consistently implementing it into any information visualization. Infographics are quickly replacing long texts to explain complex information in an abstract visual manner clearly; however, efficient message delivery can be impeded by seemingly insignificant design choices. The continuity provided by a set design system provides a consistent visual framework that decreases the reader's cognitive efforts to comprehend and retain the presented information. This article provides guidelines easily addressed to create a design system and ensure information delivery is a success.

The Importance of a Consistent System of Shape, Space, and Color

User interface/user experience (UI/UX) designers and developers know visual consistency increases a product's learnability. The font sizes, button design, and color system – all using predictable placement and uniform padding in a hierarchical nature – are fundamental before any product is released for testing. Though information design does not have the same physical interaction demands as an application (app), the human behavioral rules remain the same.

Information visualization is the graphical representation of abstract data. When presenting each element of a communication consistently, the reader—or user—does not need to learn anything about the artifact other than the key communication differences. The necessity of reducing cognitive barriers must not be ignored.

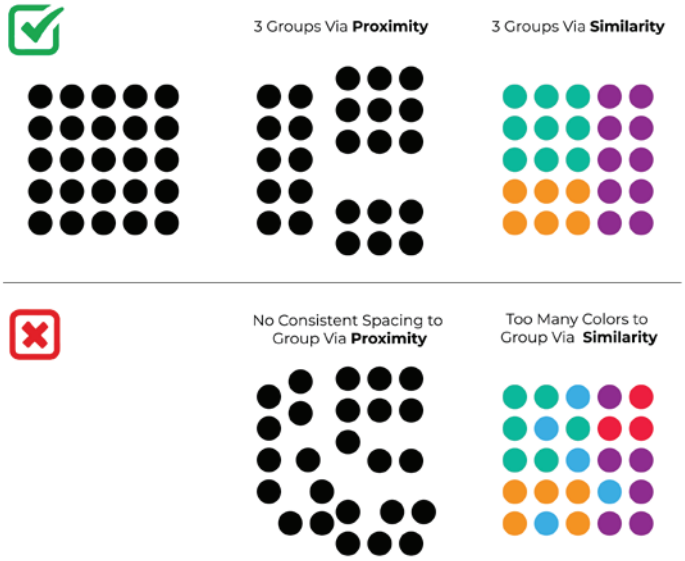

3 Groups Via **Proximity**
3 Groups Via **Similarity**
No Consistent Spacing to Group Via **Proximity**
Too Many Colors to Group Via **Similarity**

Figure 1. Patterns are used to group components.

Consistent color and typefaces are easy to understand when creating a system. Gestalt studies of visual perception prove that space is just as important as shape to simplify a complex visual world. Humans seek patterns to group components (Figure 1).

Use Visual Hierarchy to Encourage and Control Message Delivery

No matter how much one might wish a reader would spend hours reading every word on the page and exploring each element of an infographic, human nature is first to skim. If the message and its contents are not easily grasped, most readers will proceed hesitantly. By using a clear hierarchy to prioritize information into visual groups with a consistent system, readers will quickly grasp the communication's structure and engage.

Fewer than three levels results in no clear hierarchy; however, every level exceeding three degrades the organizational structure. It is easy to understand in paragraphs of text, as shown in Figure 2. Viewers must be able to easily view the consistent chunks of information, or it will compromise readability.

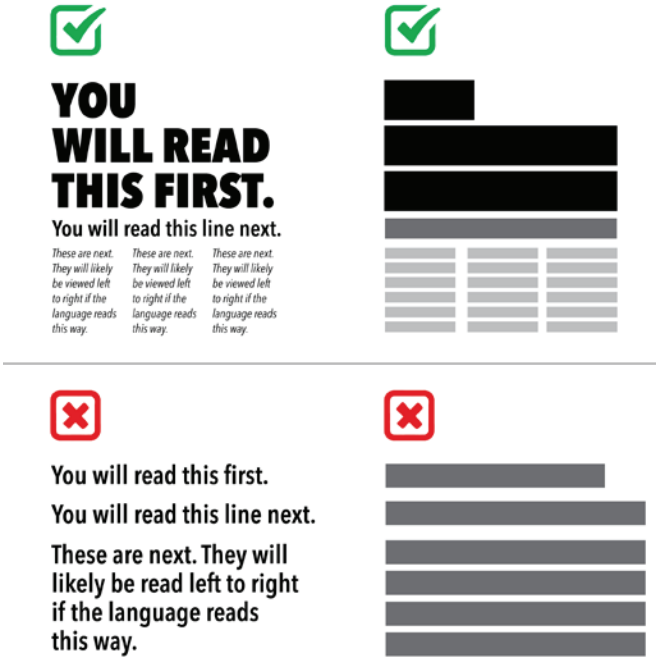

YOU WILL READ THIS FIRST.
You will read this line next.
These are next. They will likely be viewed left to right if the language reads this way.
These are next. They will likely be viewed left to right if the language reads this way.
These are next. They will likely be viewed left to right if the language reads this way.
You will read this first.
You will read this line next.
These are next. They will likely be read left to right if the language reads this way.

Figure 2. Chunked information, as in the use of paragraphs, aids readability.

It is just as important to use consistent hierarchical presentation in an infographic. If there are too many levels, no hierarchy appears. Likewise, if the levels are not treated consistently, there is no systematic hierarchy (Figure 3).

The Importance of Typographic Choices

If one must choose only three fonts to signify hierarchy, restraint in selection is also necessary. Choosing one sans-serif typeface, like Arial, Helvetica, Montserrat, or Verdana, is the preferred action. These are named sans-serifs because they are without serifs.

Serifs, like Times New Roman, Georgia, Baskerville, and Courier, are named this for the little hooks at the ends of letter strokes. Though serifs might guide reading between letters slightly on the printed page, this power is reduced on-screen. Serif faces are also not as streamlined as sans-serifs. All scripts or other alternative typefaces should be avoided completely. Regardless of trendy templates one might find, typefaces that display obvious remnants of handwriting or individuality provide a barrier when presenting abstract information (Figure 4).

Once a sans-serif typeface is chosen, only explore its family members, sizes, and (if available) color for further hierarchical levels. Typeface families usually

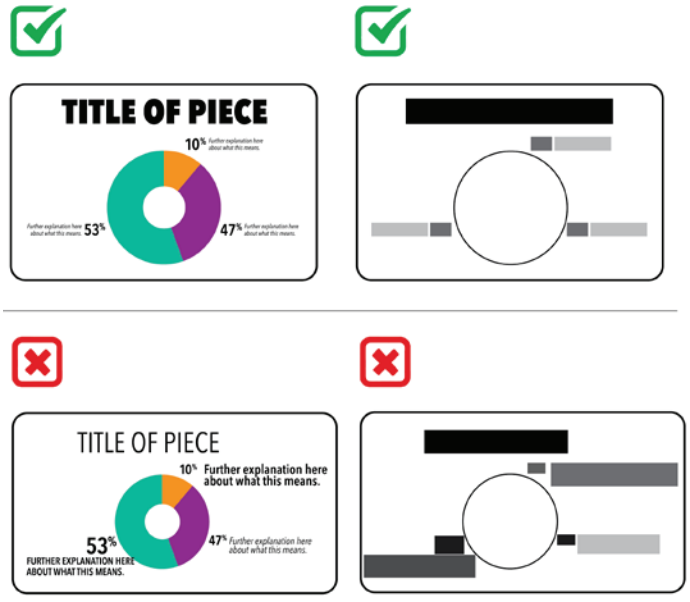


Figure 3. Examples of consistent and inconsistent hierarchies.

Figure 4. Typographic choices affect the presentation of abstract information.

include at least a Regular, Bold, and Italic font. Though italics of serif typefaces originally copied handwriting, sans-serif italics have no obvious remnants.

Another way to create a hierarchical level in one typeface family is to use ALL CAPITAL LETTERS for a title but proceed cautiously. Though the rectangular, constant shape it presents is aesthetically pleasing to designers, ALL CAPS IS YELLING AT THE READER (Figure 5). Using all capital letters are also harder to read than text using lowercase, especially for those with reading disabilities.

Do not choose any other sans-serif typefaces to use in one design system. For example, Futura and Arial should not be used in the same piece. The general shapes of sans serifs are not different enough and the use of both in one piece will appear slightly off (Figure 6).

Finally, awareness of patterns created by shape is important when choosing one consistent treatment of label text. Readers are accustomed to either of the

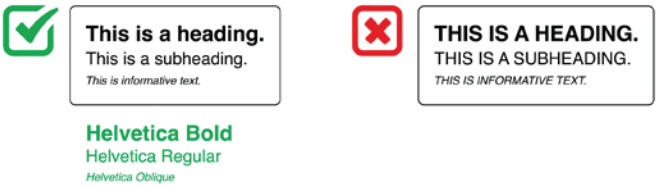


Figure 5. Using all caps can negatively affect readability.

Figure 6. Avoid using multiple sans serif font faces when possible.

You can state information like this.
It begins with a capital letter.
Each sentence uses ending punctuation.
You Can Also State Information Like This
Each Word Uses An Initial Cap
There Is No Ending Punctuation
Avoid using both of these in one group.
It Is Confusing To The Reader

Figure 7. Choose a consistent pattern for your system.

following. Choose one for your system, then be consistent (Figure 7).

Pay Attention to Space as Much as Shape

The pattern-seeking behavior to group by similarity explains the need for a consistent hierarchical system of typeface treatment. Grouping by proximity in space is the next step once a visual hierarchy is established.

Text and objects placed close to each other become chunks of information. Then the reader views the communication as a simplified element made of fewer "chunks" – versus an overwhelming amount of information – that invites engagement and focuses the transmission (Figure 8).

HEADLINE HERE
Subhead Here
More information below here, like a full sentence. There can also be a paragraph of text.
HEADLINE HERE
Subhead Here
More information below here, like a full sentence. There can also be a paragraph of text.
HEADLINE HERE
Subhead Here
More information below here, like a full sentence. There can also be a paragraph of text.
HEADLINE HERE
Subhead Here
More information below here, like a full sentence. There can also be a paragraph of text.
HEADLINE HERE
Subhead Here
More information below here, like a full sentence. There can also be a paragraph of text.
HEADLINE HERE
Subhead Here
More information below here, like a full sentence. There can also be a paragraph of text.

Figure 8. Text and other objects placed close together become simplified elements, or chunks.

Conversely, the grouping breaks when an item is not located near others. This causes unneeded distraction in otherwise streamlined information visualization, as shown in this example in Figure 9 that uses labels like an infographic's key.

Figure 9. Grouping breaks when an item is not located near others.

Use Color Wisely

When color is available, use fewer hues that work to empower each other. Using and understanding a color wheel is an easy way to apply powerful color combinations, like complementary, triadic, and analogous color schemes (Figure 10).

Complementary colors exist opposite each other on the wheel and provide the most powerful differentiation. This is key when presenting different ideas or concepts. However, these colors should not be placed on each other because they will "vibrate" and be painful or impossible to read. Groups of colors next to each other on the color wheel are called analogous. These will

Figure 10. Sample color wheel and schemes.

group via similarity. The slight differences may be perfect for portraying a group of separate but related elements, or they may be too subtle for clear communication. Triadic colors often create the most successful combination (Figure 11).

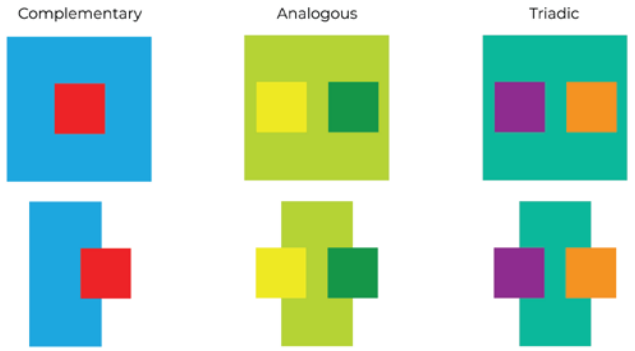


Figure 11. Triadic colors often create the most successful combinations.

Additionally, one must never assume that color symbolism will be understood the same across cultures. This is especially true when challenged with communicating an already abstract idea. Finding any "Color Symbolism" chart online is pointless unless the audience is clearly defined. For example, green can usually represent nature and conservation elements easily; however, avoid using it to symbolize finances. America is one of a few countries that use paper money in only this color. Red is another tricky hue. While much of western Europe and America find the color to symbolize intensity, aggression, power, sex, and danger, red is a positive symbol of good luck and joy in many eastern cultures. For example, it is deeply intertwined with matrimonial traditions in India and China.

Conclusion

The small amount of time it takes to decide on a consistent design system, as explained in this article, before creating any information visualization is worthwhile. Then, one must employ this system consistently throughout the piece, ensuring that space is as attended to as shape (Figure 12).

When communicating an abstract concept and/or complex data in information visualization, this easy proactive effort of design system creation provides a consistent visual framework that decreases the

Figure 12. Space and shape share equal importance.

reader's cognitive efforts to comprehend and retain the information presented. Overall, it is a minimal investment of time with maximum rewards. ■

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An obsession with advertising led **NIKKI ARNELL** (www.nikkiarnell.com; narnell@astate.edu) first to a decade as an Art Director. She then earned her MFA and did a career pivot to academia. Now a tenured professor in a college of art, Arnell mixes traditional research and design with a focus on graphic design history.

Audio Describing Tables and Charts:

A re-visualization process for sharing complex data sets with people who are blind or who have low-vision

Audio description can be integrated into the design process for any visualization projects, including for describing tables and charts.

By Brett Oppegaard, Qiang Xu, and Thomas Hurtut

Design and production of everyday tables and charts can be conceptualized as a rhetorical communicative process, during which data gets filtered and then arranged into an orderly visual fashion. The underlying data needs to be processed, mediated, and first made sense of, before it gets expressed visually in these daily forms. While tables and charts often appear as unassuming sidekicks, they should not be overlooked, and neither should their rampant inaccessibility. Tables and charts usually contain large amounts of information, cross-referenced with other data, creating complex relationships, multiple layers of meaning, and fertile paths for readers to tailor their inquiries into them based on personal interests. Technical communicators use them for good reasons. Yet what happens in this communication process if the person wanting to read the table can make sense of everything involved with all the data except they cannot see it? Can that visualization process still take place? If so, in what ways? Those were some of the questions we pursued in this study focused on tables, charts, and the accessibility level of those design elements in national park brochures.

Tables and charts in such public-place contexts typically are presented as a purely visual experience with conventional and refined aesthetics, created by a learned graphic designer, showing expertise by adherence to conventions, such as when a table is formatted into a combination of rows and columns surrounded by visual cues, including title and subtitle texts, graphical elements, and a consistent, purposeful color palette. When such a visual object is audio described, as a way for it to become accessible for people who cannot see it, the object becomes both a product of remediation and a prompt for re-visualization, in which the original designer visualized the data, but it's the audio describer who must remediate the visualization, not the original data, transforming visual media into audible media for the listener to then visualize it again.

To further isolate and examine the visuality of basic tables and charts, we approached them in this study from the perspective of people who do not have direct access to the original data or the original data visualization. People need tables and charts for the information they contain but also for the orderly way that information is presented. Like anyone else, people who are visually impaired can benefit from visualizing clear, concise summaries of larger documents, complicated systems, and complex types of data sets in formats that warrant representative structures, including tables and charts. While such "visualization" might bring to mind the act of literally "seeing" something, visualization can be both physical and intellectual, in the sense that people can conjure an image in their minds whether they have direct visual access to it or not, like when a general is visualizing a global-scale battlefield or an astronomer is pondering the billions of galaxies in our universe. To have vision, to visualize, and to interpret in visual terms all are mental processes that can be done without eyes explicitly doing any of that work. This article will create an exploratory map of this area of interest and assert possibilities for how you can integrate these best practices into the design process for any visualization projects, such as describing tables and charts as seemingly extreme examples. This visualization process through audio description makes your work richer and better for everyone.

Tables and Charts as a Visual Construct

This article focuses on tables and charts, which are two primary, ubiquitous forms of data visualizations. As described above, tables have a number of already identified design issues that researchers are actively studying, but mostly those scholarly inquiries are focused on the visualities of the genre, rather than the visualization processes needed to use them (Schwabish, 2020). A chart, from this perspective, is a visual representation of data that uses graphical symbols and algorithmic drawing rules that affect some of the visual characteristics of those symbols based on the data (Bertin, 1983; Elzer et al., 2007).

In terms of modalities, almost all tables and charts are silent, purely visual objects, making them inaccessible to people who cannot see them, and few guidelines exist in the world today about how to address that inaccessibility. Beyond alternative text, which might read something like "Table about campgrounds," Audio Description aims to create an equivalent information-exchanging experience for people who listen to the data rather than see it, meaning a table or chart that is

well-described would give listeners the same agency and information, regardless of the modality needed or preferred. A major gap exists between the ambitions for equity and accessibility, and the common audible products available for hearing and visualizing tables and charts, when or if such audio even exists (Jung et al., 2021). Recent research also has asserted a gap that may exist between current practices and what the listeners want and expect. For example, in the information visualization scientific community, several attempts have been made to apply machine learning methods to extract information from chart images and then generate some textual descriptions from it, with only limited results to show for it (Choi et al., 2019; Kim et al., 2021).

> **What happens in this communication process if the person wanting to read the table can make sense of everything involved with all the data except they cannot see it? Can that visualization process still take place? If so, in what ways?**

With chart design, for example, a conceptual model could be created via Audio Description that is grounded in universal semantic categories, such as those by Lundgard and Satyanarayan (2022), prompted by questions such as: What are the descriptive statistical concepts and relations that can be inferred, including extrema and correlations? But we were unable to find any research that validated those questions, or directly applied those ideas, or used any other detailed best practices in real contexts, so we decided to find out what was happening in this wilderness of public discourse. In that vein, we located as many examples as we could of such descriptions in public use, as a way to examine those descriptions for common features, and to create some foundational understandings about the current state of description for tables and charts, to identify significant gaps between practice and theory.

To do so, we started by examining a corpus of descriptions that we had generated as researchers in public places during the past decade.

Descriptions from Brochures in Public Places

Our collection of descriptions for this study came from a grant-funded research initiative called The UniDescription Project (UniD), www.unidescription.org. With the U.S. National Park Service as a primary funder and partner in the project, the UniD initiative has brought together teams of describers from throughout North America (mostly in the U.S. and Canada) as well as in the United Kingdom to hold nine hackathon-like workshops focused on Audio Description since 2017 (Oppegaard, 2020).

These workshops have included hundreds of people and dozens of teams from more than 170 U.S. national parks. As a part of these workshops, the teams have created audio-described visitor center brochures, which generally include 15 to 35 descriptions of the visual media on those brochures, including descriptions of photographs, illustrations, maps, tables, and charts, done at different times by different people, reflecting a diversity of approaches, styles, and skill levels. That meant our database had thousands of descriptions to consider for inclusion in our study. We then searched those descriptions trying to identify as many of them about tables and charts as we could find. We wanted to use those models to examine how such descriptions were being done by these teams, mostly composed of a mixture of park staff members, external volunteers, and participants who were visually impaired. During these workshops, we also knew we had not provided any significant instructions or best practices related to tables and charts, meaning the participants were creating rapid and ad-hoc responses to this particular accessibility problem based on whatever skills and experiences they had at the time. We considered all 271 active public projects in our database and imported all the descriptions from them into a separate database.

To find descriptions of just tables and charts in that collection, we conducted searches of these texts for keywords that would identify appropriate artifacts for

analysis, including "chart," "graph," "plot," "visualization," "diagram," "table," "list," "figure," and "infographic." We initially determined that 198 of the 271 projects contained at least one description with at least one of those keywords. But that turned out to be a lot of false positives. Because all these terms are loosely applied to a variety of different data visualization artifacts, and sometimes used colloquially, this process involved a significant amount of filtering, and our final sample had to be entirely filtered by hand, involving the authors reading every description and determining if it fit under the labels "table" or "chart" or not. In the end, we had full agreement on what was in and what was out, but we also had relatively few examples that met the cut. In the final round of debate amongst us in this exploratory study, we were left with only 22 potential table descriptions and 12 chart possibilities. We then separated tables, with multiple points of data, from lists, with only single points of data, and from historic photos of tables, leaving us with 9 remaining artifacts for analysis. With charts, we separated the classic chart styles—one bubble chart, one bar chart, and one complex chart that illustrated multiple data points, such as elevation, rainfall, and temperature—from historic images of charts and maps, leaving us with just those three examples to analyze.

Findings and Discussion

With the table descriptions we were able to locate, we found that most of them did include an introductory paragraph that explained to some degree the purpose of the data visualization and its structure, in terms of columns and rows or however it was organized. Some just provided raw data dumps. Those likely would be unusable in an audible format because of the cognitive load they would require to build meaning. Most of these descriptions visualized the data in sentence form, as if they were reporting findings from reading the table. They generally sidestepped describing conventional table aesthetics, and they did not attempt to provide broad and equivalent access to the table's data. In that respect, the more complex the table, the less access the listener was getting to its complexity, because the describer mostly was making interpretive choices. This finding opens opportunities for innovation in Audio Description and further research possibilities into ways to re-visualize data in a table, rather than filter it further through a narrative or reporting style.

With charts, and this sample is even smaller and less generalizable, we found inconsistency in labeling and in the longer associated descriptions that could also potentially plague other samples. For example, one chart was labeled as a "rectangular diagram" rather than being more formally categorized as an illustrative "line chart." Another was described as an "infographic," but it essentially just used circles instead of bars in the chart. These unusual shapes in a chart could have been confusing to the describers, but the effect of it was to show larger circles as larger numbers, just like a bar chart would communicate larger bars as larger numbers. In the third one, the chart was described as "horizontal," but the bars were presented in a vertical stack, along the y-axis, which again could have led to description confusion.

These findings not only assert and confirm a general inaccessibility of tables and charts in public discourse, but they also point to larger systemic obstacles in this area of technical communication, including vocabulary inconsistencies and scant evidence of adherence to any sort of models or best practices. In addition, these findings also raise a more philosophical concern about whether Audio Description of tables and charts should be solely focused on describing the original representation of any particular data visualization. In other words, a chart is a support system or medium for making interpretations about specific data. That's what the audience is after, to make sense of the data. Those interpretations are guided by the visuals and primarily are information-gathering activities. In that respect, the visual design enables and supports the activity of accessing the data but does not constitute the activity itself. So in the application of Audio Description to this communication context, with the listener unable to access the original piece of visual media, describers could break from describing norms in these cases and take one step upstream in the design process to find their viewpoint in the data rather than the visual media and describe the data they see underlying the visuals. That would be one way to prompt a visualization process in an equitable manner, rather than to rely on a re-visualization. ■

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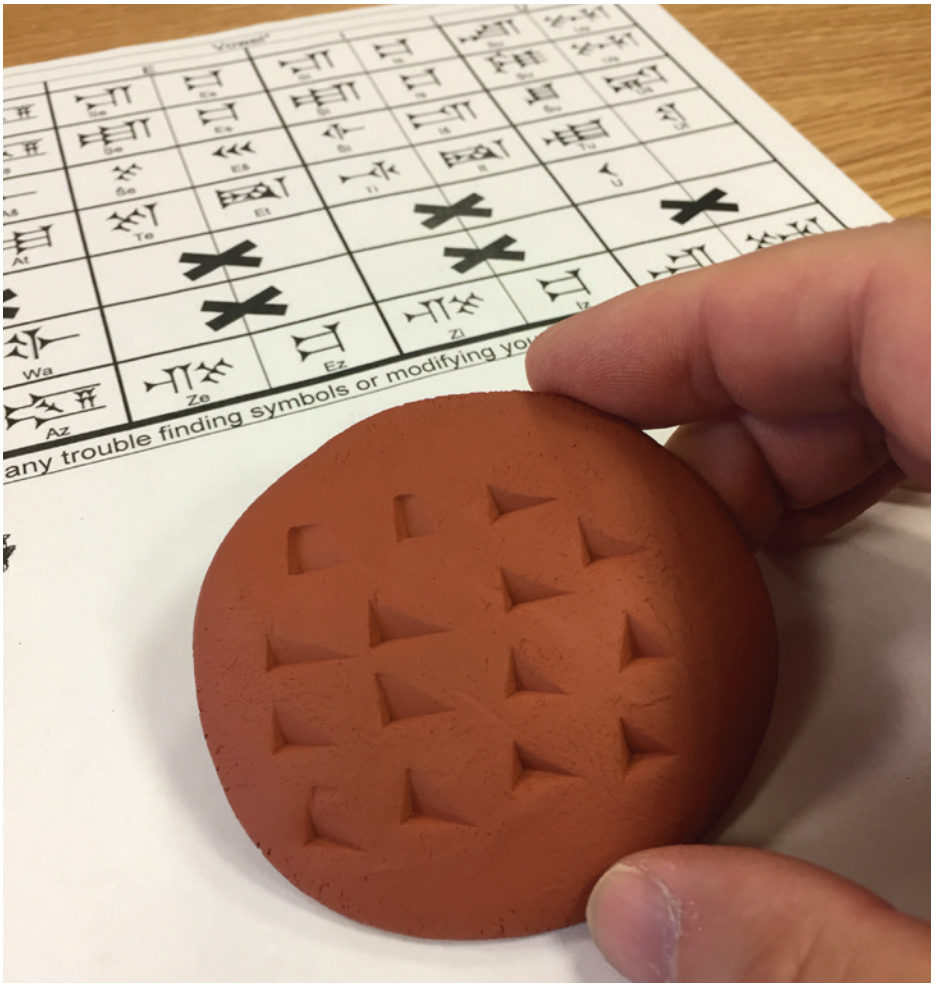
It Belongs in a Museum

BY TIMOTHY ESPOSITO | *STC President*

If you were able to attend the STC Summit this spring, hopefully you noticed the set of tables celebrating STC's 70th anniversary, courtesy of Nicky Bleiel. The tables contained memorabilia from the past several decades, including printed materials, photographs, shirts, mugs, and pens. Perhaps the largest surprise was the 4' long giant pencil celebrating the anniversary. This was an actual, functional pencil, which I confirmed by picking it up and writing with it, possibly defacing a relic for the 140th anniversary event since I see no way to sharpen it again.



While that pencil may not be the Holy Grail of technical communication, it does point to a heritage of technical communication that goes back thousands of years. In 2019, the STC Philadelphia Metro Chapter arranged for a special tour and workshop at the University of Pennsylvania's Museum of Archeology and Anthropology. Although fedoras and bull whips were not included, the museum let us hold ancient cuneiform clay tablets that were thousands of years old and try our hand at making our own tablets out of clay using chopsticks as a stylus. This experience helped to drive home the importance of technical communication; if it weren't for those highly trained ancient scribes in Mesopotamia, we wouldn't know about how business operated in the distant past. Spoilers: they had to pay taxes, too.

As we roll into the autumn in the northern hemisphere, signs begin to emerge that the year is wrapping up. Days get shorter, trees lose leaves, and everything is infused with "pumpkin spice". While that may begin the end of the calendar year/modern society, STC's year is just ramping up. Membership renewal begins. The STC awards committees generally have their application submission dates in the fall, such as Associate Fellows and Fellows. For many communities their programming year kicks off. I urge you to take a step back and look at the offerings in the calendar on http://www.stc.org where many communities post invites to the online events, and consider attending, even if you aren't in that community. Take the plunge and learn about that SIG you're not in or attend an online event in a geographically distant chapter to reconnect with old friends or make new ones. STC offers many unique networking opportunities, and as a member, you should take advantage of that. Similarly, if your community is hosting a virtual event, make certain to post it on the STC calendar. While X never marks the spot, the STC calendar might help you find a spot where you belong.

As for the giant pencil, I considered "acquiring it for archival purposes" when the conference was breaking down the displays, but decided against it since it belongs to the entire Society. That, and it wouldn't fit in my luggage or get through airport security. What takeaways have you acquired from STC this year? What would you like other members to take away from STC? Let us know via cuneiform clay tablet, carrier pigeon, or by inscribing a message to board@stc.org. ■

TIMOTHY ESPOSITO (tmesposit.stc@gmail.com) is the 2023-24 president of STC. His ongoing column will keep you updated on STC's direction, and be filled with fun cultural references such as https://www.lucasfilm.com/news/indiana-jones-quotes/.

STC@70 Part 1. Reflecting Backward

Three long-time STC members answer four questions about the past and future of technical communication

BY SAUL CARLINER, JANICE (GINNY) REDISH, and **KAREN SCHRIVER |** *Fellows*

Editor's Note: *What has propelled technical communication to its current point and what's on the horizon for the field?*

On March 15, 2023, the three authors (all STC Fellows who have been active in research, practice, and teaching for decades) shared their thoughts In a webinar, Reflecting Backward, Thinking Forward: A Conversation About 70 Past and 70 Future Years of Technical Communication, in honor of the 70th anniversary of STC.

This is the first of a two part series, transcribed from the webinar. In this part, the three look backward, exploring the most important and overrated developments in the field over the past 70 years. In the second part, they look ahead with their concerns and hopes.

The authors have edited the transcript for length and clarity.

What is the most important development in the field over the past 70 years?

Saul: I'm going to cheat and list five innovations.

- Computer technology and all other related digitalization endeavors because that's really what has led to our employment.
- Rise of the professional community and, more particularly, the rise of research in our field.

  Here's where I want to give a shout-out to my co-panelists. *The Guidelines for Document Design* that Ginny Redish and her team at the American Institutes for Research produced back in (let's just say a few years ago) was done in conjunction with Carnegie Mellon University (CMU) when I was an undergraduate there.

  Some of the research done at CMU looked at the writing process, and a lot of things that Ginny's team looked at were some writing properties. Together they really have influenced how we write.
- Word processing. One of the things the CMU team discovered in researching the writing process was that

really good writing is revised writing. You may have seen the T-shirt "Write, Revise, Revise." Word processing made it possible to do that.

- Professional associations themselves because they nurtured communication of all these other developments and the collection of all this stuff. And that led to Karen's landmark 1997 book, *Dynamics of Document Design.*
- Shift from lifetime employment to lifetime employability. In the earlier lifetime employment, you would see a lot of people become tech writers within their company because they had some facility with the technology and they could explain it to people. Now, people move among employers, tending to stay in the same career. And that led to the professionalization of tech comm.

Ginny: I agree with everything Saul said. And I agree with what I'm seeing from our webinar attendees about the internet, the move to digital computing, personal computing. But I also want to add the idea that we as technical communicators have always been user advocates.

One of the great innovations has been the spread of a user-centered focus, user-centered design, usability testing.

This is what Karen has called reader-focused evaluation. It contrasts with readability formulas and other means of looking at text in which the person who's going to actually use the text is not included.

Having a research base has made us more credible to be able to say we must be user-focused. And all the other developments that Saul mentioned have led to a greater understanding, not only among technical communicators, but also among our colleagues and clients that we must be user-focused.

One of the great innovations has been the spread of a user-centered focus, user-centered design, usability testing.

Karen: Thinking about this question, I was tempted to nominate PostScript, WYSIWYG, HTML, CSS, JavaScript, or even the internet itself because these technologies have really changed the face of technical communication forever.

But in the end, I decided that the most important thing that has happened over the last 70 years was the professional development of the modern technical communicator. Today's communicator has really benefited from educational programs and from professional organizations such as STC.

Roughly from the 1950s through the 1970s, members of the field saw themselves pretty much as technical writers. The computer revolution that Ginny was just talking about led us to change our vision of ourselves more as communicators rather than just as writers. In the early 1980s, user-centered design took off. And we started thinking about design as well as writing. Not only did our processes and our products change, but even the people who made up the field changed.

I remember when I went to my first STC conference in 1982, I went to the opening party, and on one side of the room was this large contingent of men dressed in full military uniforms, looking rather grand, I have to say. At first, I thought I must be at the wrong party. But then I realized that those men formed the core of the field at the time.

Today, the demographics have shifted. Women outnumber men; and, slowly, men and women of color are joining our field. Today, we're better at what we do across audiences, genres, media platforms. And users like our stuff.

What is the most overrated development?

Karen: The most overrated development for technical communication is the inclusion of readability statistics in Microsoft's MS Word. Adding readability output to MS Word led many people to believe that running the Flesch or Kincaid formula would tell them if their document was understandable or not.

Many writers and even non-writers look to readability output as a kind of one-button solution to understandability. But as research on usability has clearly shown, the

> **[R]eadability formulas, no matter what platform they lurk on, or what fancy clothes they wear, are vastly overrated.**

output was really overrated in terms of what it told us about text quality. And here we are many years later still haunted by the same formula in Microsoft's Office 365.

Additionally, readability formulas form the basis of many editing software programs like Grammarly, Visible Thread, and Acrolinx. So, my vote on this question is that readability formulas, no matter what platform they lurk on, or what fancy clothes they wear, are vastly overrated.

Ginny: Karen, you took my first answer to this question about the most overrated development. Readability formulas are the opposite of the user-centered focus that I talked about before.

I'll just add that all the computer-based formulas have tremendous problems. They use different algorithms to get at what they consider readability. They differ, in fact, on whether they count a year like 1997 as three words or as one unit or whether they count semicolons as if they were sentence-enders.

But, because Karen talked about readability formulas, I'll mention something else.

Another overrated development is the focus on tools. And that's sad for many of us in the profession because a job announcement might say nothing about being user-focused. Instead, it might say you have to know Figma.

So, we have to continually talk to our clients and HR people to say, "I can learn the tools. What matters is my ability to communicate clearly." We should think about ourselves as a

> **We should think about ourselves as a profession that is not tool-oriented, but user and process-oriented.**

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profession that is not tool-oriented, but user- and process-oriented.

Saul: I was going to say something regarding tools. And I decided not to, so I'm glad the two of you mentioned various aspects of that.

To me, the number one overrated development, because it didn't do what it was supposed to do, was IBM's use of the job title "information developer." And this one is personal to me because within about six months of starting my very first job, which happened to be at IBM, my job title changed from being a junior writer to being a junior information developer.

The idea behind it was that we were going to try to combine the job descriptions of the information writer, the illustrator, and the editor, add an advocacy role to that, and use a single job title. The hope was that people could move among writing, illustration, and editing all while advocating for users. At the same time, the name of the function went from Technical Publications to Information Development.

It was a really interesting idea, but ...

I was talking to somebody who worked on an experimental program where they were trying to have writers and illustrators who could be equally competent and confident with visual tools and with verbal tools. But what they found, in the end, was that the visual communicators became more sensitive to the words but not a whole lot more verbal, and vice versa.

The Information Developer job title eventually went away. And as I have been told (I had left the company by then), they ended up with two broad categories, which is really concerning to me. The lower-level people were reclassified back as writers and editors, and the higher-level people were classified in some sort of business analyst role. So, we ended up with this class system in the field, which to me is even worse for long-term professional purposes.

If you look at the history of technical communication, we've always had issues with the name. We were technical writers. Then, people became fixated on being technical communicators.

> **If you look at the history of technical communication, we've always had issues with the name.**

We need to start celebrating the terms that are already in wide use outside of our field, not create new names. We need to promote the good work we do and the unique perspectives that we bring to our projects and our clients. ■

This concludes the look back. Part Two looks forward, exploring concerns about and hopes for the future.

Acknowledgments

We thank Nicky Bleiel for chairing the STC 70th task force, inviting us to do the webinar, and moderating our discussion. We also thank Erin Gallalee for technical support of the webinar. And we thank all the STC members and others who spent time with us, listening and contributing to the webinar.

For a list of relevant references and resources on technical communication, see the bibliography compiled by Karen Schriver at Ginny Redish's website: https://redish.net/wp-content/uploads/2023_Resources_about_technical_communication.pdf

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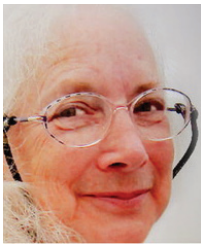

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Intersections of Technical Communication and Marketing

BY SHAWNEDA CROUT

The Interaction Design Foundation defines information visualization as "the process of representing data in a visual and meaningful way so that a user can understand it." Information visualization objectives and actions align closely with "data visualization," which at times are used synonymously by information practitioners. The trend of consumers and audiences growing more dependent on and preferring visual breakdowns of information is reflected in three jobs on the rise in 2023 that rely on the ability to produce data visuals: data governance manager, content designer, and director of bioinformatics.

Data governance managers provide oversight for the infrastructure, maintenance, security, and related best practices, policies, and proper procedures for an organization's data. Content designers can be considered the newest evolution of technical writers that includes all audience-facing content types, including social media; researches the audience accessing the content; and collaborates with engineers and UI designers to create a user-centric content experience. A director of bioinformatics is a senior level data practitioner who reports directly to C-suite executives and is responsible for providing strategic insight, statistical analysis, and predictive strategy recommendations based on previous portfolio performance coupled with market experience. Entities focused on achieving sustainable profit margins while developing scalable products employ data-informed strategies for all departments, especially customer-facing areas like marketing and communications.

As consumers continue to become more technologically savvy and gain more access to information, brands must be able to visually present complex information that demonstrates the efficacy of a solution. From medical writing to software documentation, presenting complex concepts, data sets, and analytics in an easy-to-digest way has been a part of information visualization in technical communication. For an information visualization practitioner working in a startup space or at an established brand, recognizing the symbiotic relationship between marketing and technical communication will lead to creating information visualizations that benefit future and current customers.

Marketing

Information and data visualization in marketing helps customers understand how a company's product will solve their problem.

Presenting complicated information in a clear, effective visualization can help the customer digest product benefits or features faster, leading to making a decision to purchase sooner. Visual assets can help confirm a customer's analysis of dense data by presenting it in a different way that is easier to understand, retain, and regurgitate to decision makers.

For examples of complex data sets translated into stunning infographics and visualizations, visit www.informationisbeautiful.net. For example, you'll find information that can be used to show the best performing Marvel movies. "Which is The Best Performing Marvel Movie?" is a resource a design firm could use in a pitch deck to explain how connecting the product aimed at movie goers who watched Spiderman and Shang-Chi will fare better than trying to connect the product to those who watched Incredible Hulk or Iron Man 2. Another example is, politicians looking to prove that fear-driven campaigns were intended to undermine the medically supported treatments for COVID can refer constituents to the "COVID-19 Coronavirus Data Dashboard" to see how prescribed and rumored treatments fared on a global scale for treating patients for the duration of the pandemic.

Technical Communication

Presenting high-level data and information in technical communication is beneficial for improving the clarity and effectiveness of a complex product. Information visualization often includes using varied colors and different chart types to explain complex information.

Visualization assets can be used to help the audience explore dense, complex data using visual cues that align with key performance indicators (KPIs) and goals, whether qualitative or quantitative. Some of those assets can include:

- Graphs
- Bars
- Scatter plots
- Icons that represent large populations
- Maps

Working to be a trusted resource, no matter what industry you're a part of, is a positive business use case for content design and technical communication, and for building a positive bridge between marketing and experience teams. Strengthening the relationship between technical communication and marketing by using information visualization at the intersection of marketing and technical communication can support long-term business success. From a financial standpoint, technical communication is an extension of marketing that matters the most—after you've made the sale, and that is involved with the customer the longest. Showing your customer you're committed to supporting existing products while exploring new revenue generating solutions helps improve customer retention.

A positive customer experience when accessing support documentation can reinforce the reason a customer chose your solution, providing reasons for your customer to continue doing business with your brand. Well-developed technical communication contributes to the long arm of marketing known as customer retention. Retaining customers by ethically presenting complex information with information visualization builds trust with your brand. A supported, satisfied customer is a kept customer. ■

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Genre in the World:
How English Degrees Taught Me to Take Action in Life

BY SABINA BARBER

Genre as a Tool

Genre is more than a classroom tool that helps people categorize and analyze literature, art, and music. Genre helps us frame the requirements, rules, nuances, and deviations of communicating in certain contexts. Caroline Miller explains the three dimensionality of genre in her text, "Genre as a Social Action" when she writes, "genre embodies an aspect of cultural rationality…for the student, genres serve as keys to understanding how to participate in the actions of a community" (Miller 1984, 165). Genres that students learn in the classroom are part of a bigger scheme of the working world. Pieces created within genres come from people who have experienced the world and want to express their living in a sharable form. Their experiences transfer to literature, art, music, and other forms of expression that are put into categories of genre. When students learn genre rules to analyze work that arose from lived experiences, they can understand the part(s) of society that the creator of the piece wanted to share. When students internalize this knowledge they learned from different genres of work, they have keys to understanding the world that was handed down to them, and they can use their genre knowledge to create work to help make better worlds outside of the classroom.

My Experience

My background in understanding genre comes from studying various fields of English. In 2020, I earned my bachelor's degree in literature with a minor in creative writing. Then, in 2023, I earned my master's in rhetoric and composition, but half of my classes were in technical communication. From these studies, I learned how to read, analyze, write, and use numerous genres that have moved me through the world. Even though I have come far in my learning, my understanding of genre started at a conceptual, theoretical level.

Literature

When I was in literature classes and analyzed a piece like Charlotte Perkins Gilman's *The Yellow Wallpaper*, I thought about eighteenth-century gender roles. By analyzing *The Yellow Wallpaper* through the feminist genre lens, I was observing how society functioned in the eighteenth century for an ill, high-class woman. This analysis allowed me to see feminist issues that were prominent then, and are still relevant now. From analyzing literature in various genre lenses that induce critical thinking and empathy, I was able to understand different issues that arose from the lack of human rights, but I did not know what to do with that information other than write essays for class that only a professor saw.

Rhetoric and Composition

After working with genre through literature, I expanded my study of genres to rhetoric and composition. In this field, I learned how to analyze texts and their related elements (words, images, people, physical spaces, etc.) From rhetorical analysis, I learned that the American perspective of nature is romanticized through the genre of rhetorical ecology. An example of romanticization of nature is when someone takes pictures of remote wilderness landscapes without people in it, which can be seen in the image on the preceding page.

Understanding how rhetorical decisions influence people in extreme and mundane ways is the most important genre-based lesson that I learned through rhetorical analysis. Even though rhetoric and composition taught me more about genres, I was not sure how I could use it in ways that impacted my communities.

Technical Communication

Until taking technical communication classes, I did not understand how I could use genre outside of the classroom. In technical communication, I learned how to write technical documents used in workplace and community settings, and how genres can serve larger purposes than theory, analysis, and critical thinking. I encountered the real-world use of genres when I wrote an accessibility proposal for an official government website for blind and visually impaired people, which provides local news, support, and other information and resources.

Using Jay Dolmage's *Academic Ableism: Disability and Higher Education*, I took concepts of what makes an accessible world and applied them to the website. The first concept was "Movement—getting there—how we get to an event or a class" (Dolmage 2017, 118-9). People who are visually impaired rely on speech commands and text to talk to navigate the digital world. However, the website could not be processed through a screen reader; there were no speech command options; and the text to talk was confusing and difficult to follow. While there were more issues with the website, I took all of the issues that I saw and wrote an accessibility proposal. The proposal is a small example of how using a technical communication genre allowed me to use my knowledge of accessibility and website design to create a text that points out flaws that were detrimental to an entire community's accessibility and how those flaws could be fixed. While my piece did not change the website (which has fortunately been improved by the organization since my work in that class), it demonstrated that through technical writing via a proposal, I have the ability to fix issues in the world with a written document instead of theorizing and conceptualizing how issues can be fixed.

Use Genre to Change the World

Genre is more than a classroom tool to help students analyze work. Outside of the classroom, genres transform entire communities. In the majority of English classroom settings, genre helps students conceptualize different themes and topics, but technical communication classes taught me that, to truly understand genre, it is important to understand how using genre can enact change in the real-world. When students can apply what they learned in the classroom and apply it to their lives and communities, they can make differences for themselves and others. ■

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SABINA BARBER recently earned her master's degree at Boise State University in Rhetoric and Composition. She has a love of working with words and all genres of work. Sabina is passionate about exploring various aspects of life and values being a lifelong learner.

Certified Professional Technical Communicator (CPTC) Candidate Showcase

BY MEG NELSON | *CPTC Practitioner & Member*

Can you tell us about your background and your current role?

Non-traditional – that's the most accurate description of my background! Before my last semester, I dropped out of college to chase a dream: founding a charity in Uganda. I moved to Kampala and dove into our mission of connecting formerly trafficked women to financial services, particularly burgeoning fintech solutions. This was where I first dipped my toe into technical writing.

The core of my job was technical communication. To fundraise, I had to translate the technical aspects of what we were doing with financial services and fintech to donors halfway around the globe. It was a challenge, and I loved it. And thankfully, while I was getting the charity off the ground, I chose to finish my college degree in absentia (and the University of Tennessee kindly allowed me to do so).

After six years of running the charity, I had an 'a-ha' moment. I realized that I truly enjoyed writing about financial services, not running an organization. So, I transitioned to doing just that.

Now, six years on, I've had the privilege of writing for financial services and technology companies on five continents. I've translated some of the most complex financial and technology concepts into jargon-free content that opens the door to financial inclusion for unbanked individuals and new markets for pioneering companies.

For the last four years, I consulted for the Bermuda Monetary Authority as their Senior Technical Writer, writing speeches, editing regulatory documents, and continuing to soak up what's next in the industry. In June, I moved back to the US, stepping into my current role with the Federal Reserve Board as a Senior Media Relations Specialist.

Can you talk about your Technical Communicator journey?

When I went to college, I had a very different idea of what I wanted to do with my life. I wanted to move to another country, start a charity and dedicate my life to that. I knew a degree in social work would provide me with the foundation I needed to do it – and it did. Unfortunately, as any social worker will tell you, the burnout rate is extremely high. After six years, that's where I ended up.

So, I had to make important decisions about what I could do next that would rejuvenate and fulfill me. Writing was the obvious choice. I had always used it as an outlet, relishing the use of words to paint pictures, tell stories and help others look at complex topics in a different light.

The trouble with this transition was my degree. A Bachelor of Science degree is invaluable, regardless of the field. But, when you're trying to land a writing gig, it's an uphill battle if that BSc isn't followed by 'in Communications' or 'in Journalism' or 'in English'. For two years, I struggled, jumping at every freelance

opportunity I could get. I then landed a full-time consulting position.

Nevertheless, three years in, I realized I needed something more than writing experience on my resume. I needed an educational 'stamp of approval'. I also knew that going back to school to get another degree was too big of a commitment for me to make at that time. The CPTC certification became the clear Goldilocks solution.

I immediately signed up and started studying. A few months later, I passed the Foundation level test. After earning this certification, I started seeing a difference. I started landing interviews and eventually received a job offer for my current role. Nevertheless, I decided not to stop there. I wanted the Practitioner level certification. So, last year, I got back to it, took the Practitioner level exam prep class and just last month, I passed.

Can you explain why you chose the CPTC certifications (e.g. course content, format, learning outcomes, read reviews online, etc)?

When I decided it was time for me to pursue a certification, I did a deep dive into Google to see communications-related options. I read certification descriptions and student reviews. The Society for Technical Communication immediately stood out as the best fit and the most respected certification/professional society.

I also liked that it was a multi-level certification process, where the first level concentrates on the theory, the second on practical application and the third on showing mastery. Across the exams, it uses the same book and concepts. So, as you study for the next level, it further cements the information.

Additionally, when searching for the right certification for me, I saw that most others were dedicated to writing and editing. CPTC is more holistic, having you think about research, planning, organization, design, etc. The more I considered it, the more I realized that these other considerations allow you to develop strong documents, not just strong sentences and paragraphs.

What are your thoughts on the training and exams?

Initially, when I began reading the book on which the exams are based, I thought that the knowledge was too basic and common sense. Then, once I was a few chapters deep, I realized its brilliance. The book takes all of the 'common sense' concepts that most people know about writing and structures it – almost mathematically – into a system. It organizes the writing process into steps and changes how you think about writing and the questions you ask yourself.

Regarding the exam, there's no way around admitting that it's tough. Nevertheless, when used properly (e.g. to understand the types of questions asked and the objectives covered), the study guide saves you a lot of time studying and how much you spend on each question in the exam.

While I just used the study guide, book and practice exam to prepare for the Foundation level, I wanted an additional resource for the Practitioner level. I took the STC exam prep class and am glad I did. The instructor was very thorough and took the time to explain the reasoning behind the concepts we struggled with. He also offered insight into how we should approach the different types of questions and the different exam strategies we could choose.

What was your experience with virtual training? Did anything pleasantly surprise you (e.g. despite training being online it felt very personal)?

That's exactly what surprised me about the virtual training – it felt personal. I expected to sit there with my mic on mute, but we were interacting the whole time. It was also a relatively small class size, so each class was personalized to what the students wanted to focus on. The instructor regularly checked if

we had any questions and would raise questions for us to answer, too.

Is there a key piece of information or learning outcome that has really resonated with you? Can you give an example of how you might implement this in your role?

In my current role, I can get bogged down with assignments and lose track of documents' purposes. The CPTC certification was a good reminder to take each document in isolation and ask yourself what the main point is. There have been a few instances where I went back to management and said, "I don't think we should be drafting this", or "Maybe we should use a different genre." They ended up taking my advice.

Can you explain how you have used your skills and knowledge in your role and explain to what extent?

The skills I've learnt through the CPTC training have enhanced my outcomes. I ask questions that I never asked before. I have a methodical approach to researching and organizing before drafting documents. I have also developed an eye for design, particularly with graphs and charts and ensuring they are used effectively.

I've noticed that these adjustments to my approach have changed my outcomes. Fewer documents are sent back to me with editing requests, or the requested edits are fewer in number.

Is there a discernible difference in your role before the training and after?

Learning and honing technical writing skills is only beneficial to your ability to communicate personally and professionally. Additionally, I think it gives you a boost in confidence. Employers undoubtedly see this (not just on your resume but in the quality of your cover letter and how you answer interview questions). In my experience, this was the most significant discernable difference—in how I present myself and my skills to potential employers. Four months after receiving my Foundation level certification, I was offered a full-time job at the Bermuda Monetary Authority. I earned my Practitioner level certification in December 2022 and, five months later, I received a job offer from my dream employer.

How has certifying in CPTC helped you develop your career and skills?

It gave my resume the legitimacy it lacked. More importantly, though, it transformed how I conceptualize any writing project. It organized the process and made me a much more strategic communicator.

Can you talk about your participation in STC as a member and how you see your activities helping others to understand and appreciate technical communication as a discipline?

For the last few years, I have lived as an ex-pat and, therefore, have been unable to join a local chapter or attend STC's annual conference. This year, though, I'm thrilled to be able to attend and be more actively involved in STC's offerings, such as their Slack Workspace and special interest groups, particularly Women in TechComm.

How do you think your organization will benefit as a result of your success with the CPTC training and exam?

The quality of my work and its improvement is the most tangible benefit. Additionally, because of this notable improvement, the rest of my department at my former employer, the Bermuda Monetary Authority, signed up for a membership with STC, and some of them were planning on taking the CPTC exam.

What would you say to individuals considering taking the CPTC training & exams?

Do it! It is a great way to organize your thinking around writing, whether you're actually in the technical communication field or not. The ability to communicate your purpose and value proposition is invaluable across different industries, professions and positions.

Can you provide a short bio about yourself please?

As a senior media relations specialist for the Federal Reserve Board, I am responsible for supporting the Board's policy of enhancing public understanding of

monetary, regulatory, economic and financial issues regarding the Board and the Federal Reserve System. More specifically, this involves giving accurate and understandable information, both written and spoken, through various means, including everything from press releases and talking points to background conversations and statements to the media.

Prior to this work, I served as the senior technical writer for the Bermuda Monetary Authority, where I was responsible for researching and planning, organizing and drafting, improving the style, designing, and revising and editing documents across genres. My specialization was in speeches, document forewords, talking points and thought leadership.

I began my career as the founder and executive director of a non-profit that connected formerly trafficked Ugandan women to financial services. After six years, I transitioned to writing full-time but remained within the financial services space, crafting thought-leadership, blog posts and newsletters for financial services and technology firms worldwide.

This work has been supported by continuous learning and development. Since earning my Bachelor of Science in Social Work, I have earned the Digital Transformation in Financial Services Specialization online through the Copenhagen Business School and the Foundation and Practitioner levels of the Society for Technical Communication's CPTC. ■

MEG NELSON, Meg Nelson is a Senior Media Relations Specialist for the Federal Reserve Board. She is a graduate of the University of Tennessee (Knoxville) and a CPTC Certified Professional Technical Communicator.

**The views expressed in this article are those of the writer and do not necessarily reflect the views or positions of the Federal Reserve Board.*

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Event	Points
STC Annual Membership (any membership type for Foundation certificants)	2
STC Recorded Webinar (self-study)	1
STC Live Educational Webinar (free, sponsored, and community webinars excluded)	2
STC Online Courses	6
STC Summit Pre-Conference Courses (full day)	6
STC Summit Pre-Conference Courses (half day)	3
STC Annual Summit	8
Begin and complete a college-accredited course related to the Technical Communication field	8
Published articles that relate to any aspect of *Technical Communication* (2/article)	2
Published books publicly available on topics related to *Technical Communication* (5/book)	5
Presentations at conferences related to aspects of *Technical Communication* (2/presentation)	2
Total needed within 2 years post-certification date	**12**

Fees

Exam fees: STC Members $297, Non-Members, $594

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